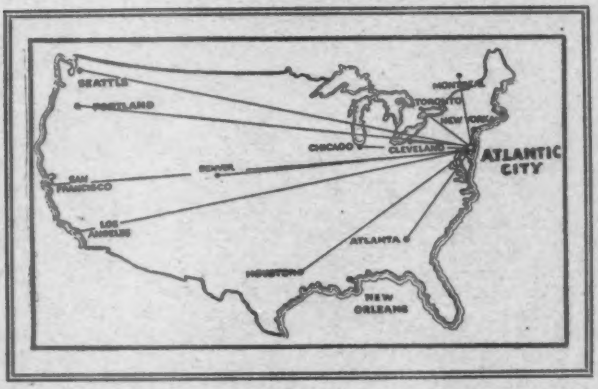
AMERICAN GAS ASSOCIATION MONTHLY

Vol. VII No. 10

OCTOBER, 1925



All Roads Lead to Atlantic City

October 12-16

An Open Letter

From B. J. Mullaney

THE PEOPLES GAS LIGHT & COKE COMPANY

PEOPLES GAS BUILDING MICHIGAN AVENUE AT ADAMS STREET

CHICAGO Sept. 14, 1926.

TELEPHONE WABASH 6000

Dear Sir:

I am writing you about the Home Study course on Manufactured Gas now offered to gas company employees by Columbia University for the American Gas Association. You have probably received the official announcement and prospectus.

This course has been undertaken in response to demand from all over the country for something of the kind. It has been carefully worked out by Columbia professors in cooperation with the A.G.A. headquarters staff and the association's Committee on Education of Gas Company Employees. It is believed to be the best thing yet developed by the A.G.A. for raising the general efficiency-tone of the industry. It offers ambitious employes a chance to study the fundamentals of the gas business under competent direction and supervision, and at a bargain price.

Our company thinks so well of it that we are tying it in as a major item in the program of our Training and Education department. We are canvassing all employees who are eligible to take the course, are encouraging them to take it and will follow through with supervision of their progress.

It is scarcely necessary to emphasize that the success of the course will be measured by the degree to which gas company executives interest themselves in getting it used, and results will go far to influence future A.G.A. undertakings of analagous character for the betterment of the industry.

May I not urge the fullest possible cooperation by your company?

Yours very truly,

Bernard J. Mullaney

Vice President

M/T

IT'S DONE WITH HEAT

YOU CAN DO IT BETTER WITH GAS

Enroll now! Later may be too late. All inquiries should be addressed to the Committee on Education of Gas Company Employees, American Gas Association, 342 Madison Ave., New York, N. Y.

AMERICAN GAS ASSOCIATION MONTHLY

342 MADISON AVENUE, NEW YORK, N. Y.

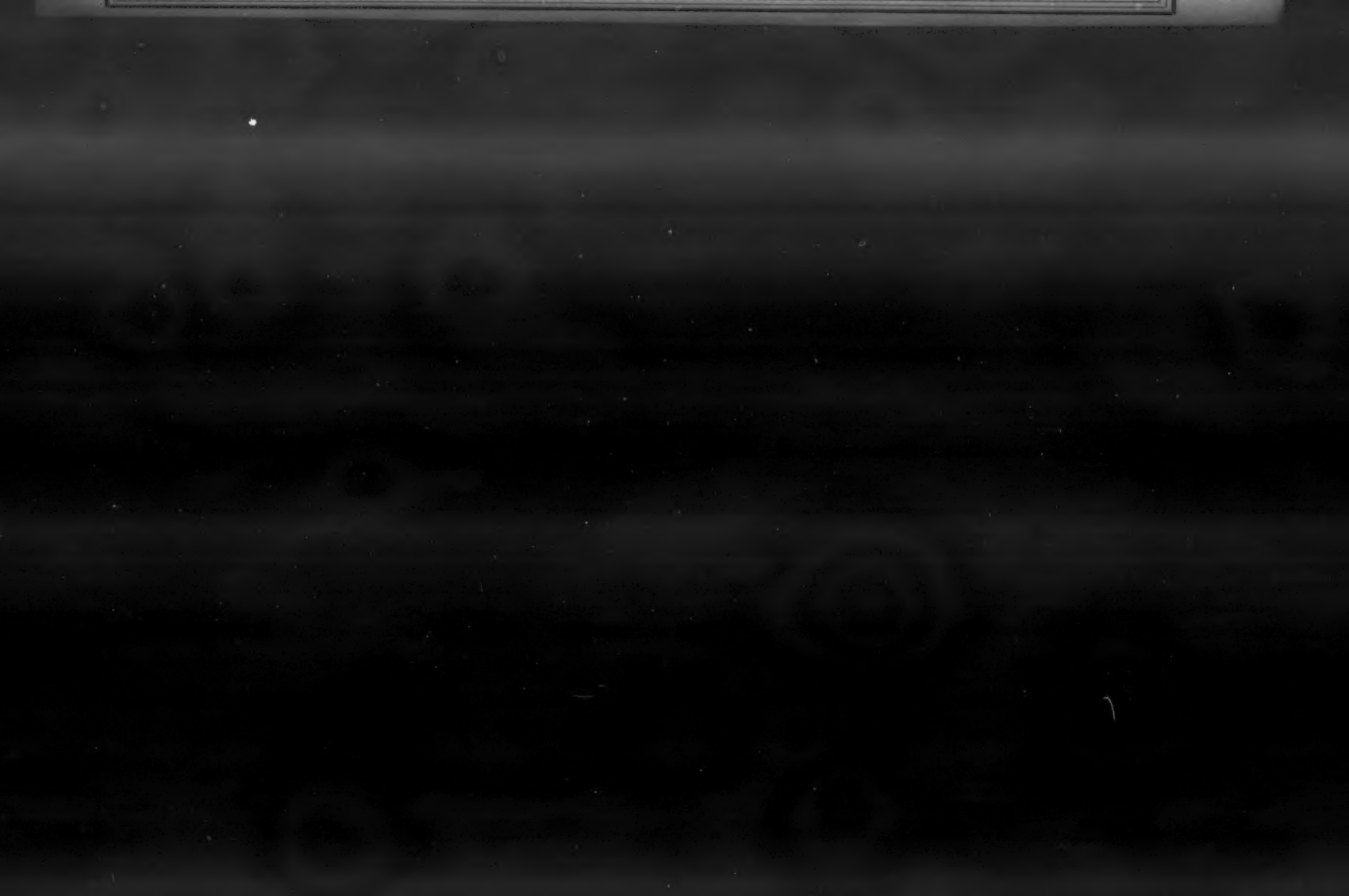
HENRY OBERMEYER
Editor

VOLUME VII — OCTOBER, 1925 — NUMBER 10

CONTENTS

SUBSCRIPTION RATE — *$3.00 PER YEAR*

Entered as Second Class Mail Matter at the Post Office at Brattleboro, Vermont, February 10th, 1922, under the Act of March 3, 1879.



AMERICAN GAS ASSOCIATION MONTHLY

342 MADISON AVENUE, NEW YORK, N. Y.

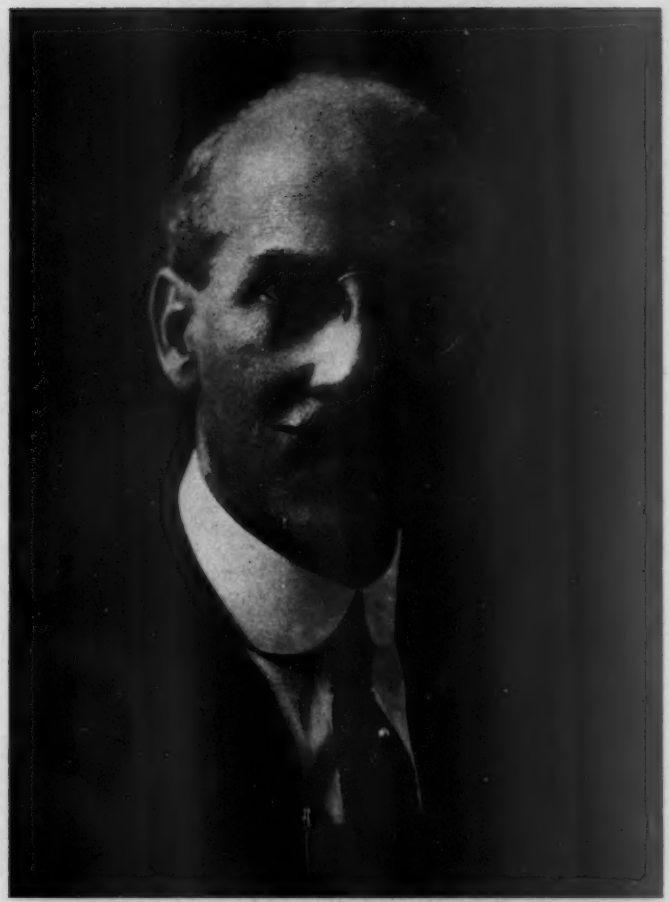
VOLUME VII | OCTOBER, 1925 | NUMBER 10

CONTENTS

SUBSCRIPTION RATE *$3.00 PER YEAR*

Entered as Second Class Mail Matter at the Post Office at Brattleboro, Vermont, February 10th, 1922, under the Act of March 3, 1879.

Our Own Who's Who



V.

JOHN BARTLEMAN KLUMPP

BORN Jersey City, N. J.; Graduated Stevens Institute of Technology 1894 with Degree of Mechanical Engineer; Entered Employ of The United Gas Improvement Company in 1894, and in 1901 Was Appointed Superintendent of the Omaha Gas Company; 1904 Was Appointed Inspecting Engineer of The United Gas Improvement Company; In 1906 Was Appointed One of the American Experts by the National Civic Federation to Investigate Municipal Ownership and Report on the Operating Conditions of Gas Works in Great Britain; In 1919 Was Appointed Assistant General Superintendent of The United Gas Improvement Company; For 12 Years Was a Member of the Prime Movers Committee of the National Electric Light Association; Was Elected First Chairman of the Technical Section of the American Gas Association; President of the American Gas Association, 1923-24; Vice-President of The United Gas Improvement Company Since 1924; President of the Allentown-Bethlehem Gas Company Since 1923.

AMERICAN GAS ASSOCIATION MONTHLY

Vol. VII OCTOBER, 1925 No. 10

Economies of the Reverse Blast

By A. C. HOWARD, United Gas & Electric Engineering Corporation

THE reversed air blast process was developed especially for improving the operation of water gas sets using bituminous coal as generator fuel. The distinctive feature of this process is that, during part of the blow, the generator blast passes down through the fire, being admitted at the top and taken out at the bottom. From this reversal of the usual direction of the generator blast, the process takes its name.

This process was tried out during its experimental stages in the gas works of the Union Gas & Electric Company, Bloomington, Ill. After the experimental work in this gas works was completed, two other sets were equipped for reversed blast operation, one of these being in the gas works of the Richmond Light, Heat and Power Company, Richmond, Indiana, and the other in that of the Citizens Gas and Fuel Company, Terre Haute, Indiana. Owing to the fact that the latter company purchases coke oven gas, the set in their plant has never been operated but for a few hours' trial.

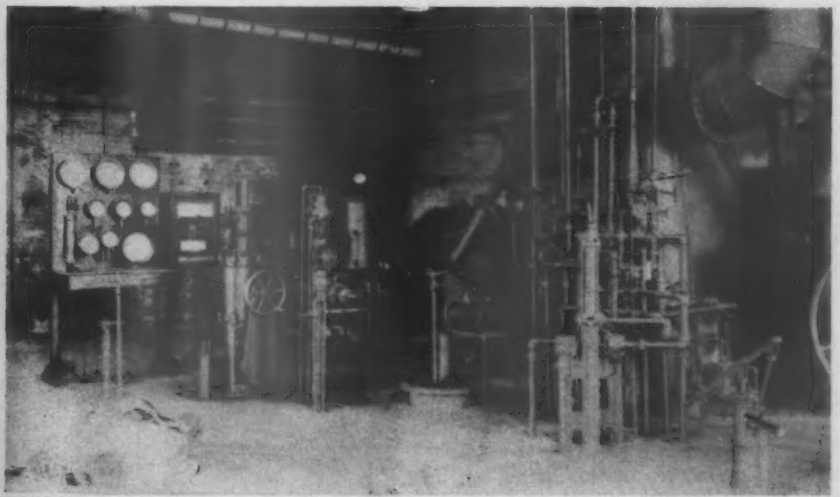


Fig. 1. Reverse Blast Installation in the Water Gas Plant of the Richmond Light, Heat and Power Company, Richmond, Ind.

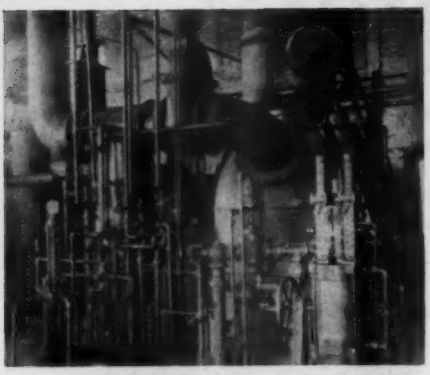


Fig. 2. Detail Showing Nozzle Through Which Reversed Air Blast Enters Top of Superheater.

The sequence of the cycle for the reversed air blast process, as operated in these plants, is as follows:

Up Blast.
Reversed Blast.
Up Run (All oil in during this period).
Down Run.
Up Run.
Air Purge.

The reversed air blast in this cycle takes the place of the blow run employed when operating an ordinary set. During this period, the air is admitted into the top of the superheater, passes down through the superheater, up through the carburetor and down through the generator. From the bottom of the generator, the reversed blast gases pass directly to the tar batter. During the up run the blue gas also passes directly from the bottom of the generator to the tar batter through the same pipe, which is called the bypass pipe.

Figs. 1 and 2 show the installation at Richmond, Indiana. The nozzle through which the reversed air blast enters the top of the superheater can be distinctly seen. The double inlet tar batter and the bypass pipe which leads from the bottom of the generator to the tar batter can be seen in Fig. 3.

Fig. 4 shows diagrammatically the piping arrangement on a set equipped for reversed air blast operation.

The reversing valves are installed in the tar batter. They are under water and are operated hydraulically by outside mechanism. This type of valve consists of two ball discs which are machined and ground to fit tightly against the dip pipes. The mechanism is designed so that when one of the valves is closed, the other must be open. This valve mechanism is locked altogether independently of the hydraulic pressure, and when one of the valves is closed, it will remain closed against any steam pressure or blast pressure until the mechanism is operated so as to reverse the valves. The installation of these valves eliminates the usual "hot valve" altogether. This valve is always cool, being immersed in the tar batter water, and, if tar should collect on the valve, it will aid rather than hinder in keeping the valve tight. We have not yet tried out this type of valve, but from the results of experiments made in the Richmond plant in perfecting this valve, we have every reason to believe that it will be thoroughly satisfactory.

As the down run gases bypass the carburetor and superheater, they leave the set at the bottom of the generator at a comparatively low temperature, between 500 and 600° F. When using the ordinary down run, the gases not only leave

Fig. 3. Double Inlet Tar Batter and Bypass Pipe, Leading from Bottom of the Generator.

the fire at a much higher temperature than this, and thus take more heat away from the fire itself, but these gases leave the top of the superheater at some 1200 to 1300° F. and thus take more heat away from the entire set. Naturally, besides losing this heat in the set, this piles up more work on the condensing equipment. By reducing the heat carried out of the set, the reversed blast process causes a saving in generator fuel.

The reversed air blast gases, when passing through the superheater and carburetor, are preheated. They come in contact with the top of the fire at a higher temperature, and besides this the cool air entering the top of the superheater reduces the temperature there. This means that, with the lower temperature at the top of the superheater, the up blast gases and the up run gases leave the set at a somewhat lower temperature and effect another saving in generator fuel.

When passing through the checker brick, the reversed blast gases furnish the necessary oxygen for burning off a portion of the carbon and tarry matter deposited on the checker brick.

When arriving at the top of the carburetor, the reverse air blast gases consist of oxygen, nitrogen and some carbon dioxide at a temperature of around 1500° F. When these gases enter the top of the fuel bed, their oxygen content forms carbon dioxide by uniting with the carbon, and steam by uniting with the hydrogen in the coal. The resulting mixture of nitrogen, carbon dioxide, water vapor, together with certain volatile gases from the coal, is further heated as it passes through the fire, because the fire is hottest near the bottom after the just completed up blast.

As the reversed blast gases continue to pass downward through the fire, the carbon dioxide content formed at the top of the fire is converted into carbon monoxide by uniting with the carbon of the generator fuel. This would seem to indicate that the reverse blast gases contain a larger percentage of carbon monoxide than do the gases of the ordinary blow run. It is hardly necessary to add that both the ordinary blow run and the reversed blast are made at the end of the blow, because at that time the fire temperature is highest and, therefore, the maximum amount of CO will be produced.

When using the ordinary up blow, air enters under the grate and passes up through the fire. The carbon in the generator fuel near the bottom of the fire is converted into carbon dioxide. The reaction in this conversion generates slightly over 14,500 B.t.u. for each pound of carbon consumed. This heats up the bottom of the fire. When arriving at the higher parts of the fire, some of this carbon dioxide is changed to carbon monoxide, and this reaction absorbs slightly over 10,000 B.t.u. per pound of carbon converted so that this portion of the fire receives heat only from the hot gases passing through. The tendency is to heat the bottom of the fire to a temperature higher than the fusing point of the ash in the fuel, and thus to form hard clinkers with the resulting extra cost of cleaning and uneven resistance of ash to the flow of the air through the fire.

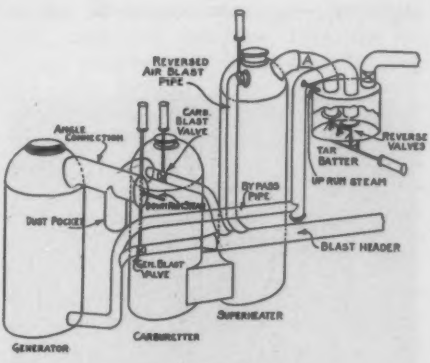


DIAGRAM OF REVERSED AIR BLAST — WATER GAS SET

Fig. 4. Diagrammatic Piping Arrangement on a Set Equipped for Reversed Air Blast Operation.

If the reversed blast is used, the up blow is short and therefore is stopped before the bottom of the fire has reached such a high temperature. When it is followed by the down blow, the effect on the fire is reversed, because the carbon dioxide is formed at the top of the fire where the air enters, thus heating the top, and down in the base of the fire this carbon dioxide unites with carbon in the generator fuel, forming carbon monoxide, the reaction absorbing the heat. The result of the reverse blast causes a more uniform distribution of the heat throughout the fire. It permits the maintenance of a higher average temperature in the fire at the end of a blow with a lower maximum temperature.

The meaning of this is that the average temperature of the entire fire at the end of the blow can be maintained at a higher point than when the up blow only is employed, and even though this is the case, the temperature of the bottom of the fire at the end of the blow will be lower than when the up blow is employed. By eliminating overheating in the base of the fire, the clinker conditions are vastly improved. The bottom of the fire where the ash collects is not hot enough to fuse the clinker in mass and thus form large hard clinkers, but can be maintained at a temperature having only a slight slagging action upon the ash in the fuel. The clinker so formed is easily broken and is easily removed.

Fuel at the top of the fire contains from 4 to 12 per cent of ash, according to the kind of fuel used. As it passes down towards the bottom of the fire, the carbon is gradually consumed and the percentage of ash present increases. There is but little carbon remaining at the bottom just above the grate. The fusing of this ash, besides causing hard clinkers, results in increased resistance to the blast or the formation of channels through the paths of least resistance. Any change in operation which will reduce the maximum temperature at the base of the fire where the ash accumulates will partially or wholly do away with its fusing. The reversed blast process reduces the maximum temperature and the average temperature just above the grate without reducing the maximum temperature or average temperature of the fire as a whole by distributing part of the heat usually in the base of the fire through the entire fuel bed.

In our sets employing this process, the absence of the formation of side wall clinkers is particularly noticeable. A report from the Union Gas & Electric Company states that, with the reversed blast, the clinker can be easily controlled. The clinker can be kept down low where it is readily accessible for cleaning, clean-

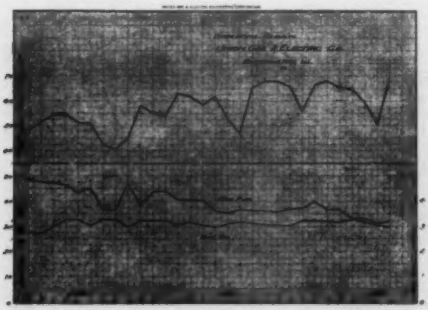


Fig. 5. Chart of Operating Results in Union Gas and Electric Company, Bloomington, Ill., Since Jan. 1, 1923.

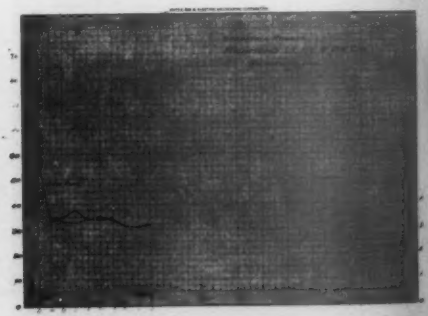


Fig. 6. Oil and Generator Fuel Consumption in Richmond Light, Heat and Power Company, Using Reversed Blast.

ing requires less time and a deeper active fuel bed is obtained. There have been periods as long as three months where it was unnecessary to bar down from the charging floor at all. There is practically an absence of side wall clinkers. On the occasions when side wall clinkers have been encountered, they are believed to be due to a change in fuel, the side wall clinkers having formed before a proper operating schedule for the new fuel was established. The Richmond Light, Heat & Power Company report that the clinker is very easily removed, that it is soft and most of it ash and is flat down on the grates. They state there is hardly any side clinker at all, and, when there is such formation, it can be removed very easily from the downstairs door. They have operated for a period of two months without barring down from upstairs at all.

Actual experience indicates that the life of the checker brick in the carburetor and superheater is prolonged when the reversed blast is employed. This is more noticeable with the checker brick in the superheater. The checker brick in the superheater in Bloomington had been 3,329 hours in service prior to the installation of the reversed blast, and since the reversed blast has been installed these brick have been in service, at last report, 6,782 hours. Examination at this time showed that they were entirely free from carbon and it was unnecessary to clean or rechecker the superheater, although this checker brick has been in service over 10,000 hours.

The condition of the checker brick in the carburetor in Bloomington was somewhat different. The carburetor was rechecked the first time after 1,520 hours of reversed blast operation and rechecked a second time after 1,778 hours of reversed blast operation. In each case the brick was in good shape with the exception of five or six top courses. These top courses were covered with a slight slag which made it necessary to renew the bricks. The condition was such that it was impossible to decide whether this slag was due to a deposit from oils or to the fact that a considerable amount of breeze was carried across from the carburetor. In each case the greater part of the old brick was returned to the carburetor and used again.

Both the Richmond and Bloomington companies operate their water gas sets for 10 to 14 hours a day, according to the sendout. In both of these plants, as stated before, one 8′ set is equipped with reversed blast process. In both plants the set equipped with the reversed blast is operated continually and alone, except during short periods of time when this set is shut down for repairs or rechecker-ing. From the above, it will be seen that as a general rule the companies' regular monthly operating results practically represent results from the reversed blast sets only.

Here is a curve, Fig. 5, which shows the operating results in the Union Gas & Electric Company since January 1st, 1923. The reversed blast process was put into operation in the summer of 1924. An examination of the capacity curve, and the gas oil curve, will give a good idea of the general improvement effected by this process. This improvement was not determined by any test, but is shown here by a long period of regular gas works operation. During the months of December, 1924, and May and June, 1925, the reversed blast set was not in operation for the entire month. During each of these months a smaller set without reversed blast was in operation all or a large percentage of the time.

The Richmond Light, Heat & Power Company distributed natural gas until the first of November, 1924. Since that time water gas has been manufactured, and nearly all of such gas has been manufactured with a water gas set equipped with the reversed blast process. The curves, Fig. 6, show the generator fuel per M (full line) and the oil per M (dotted line) during this entire period of operation. As before stated, clinker con-

ditions in this set have always been very favorable. The clinker indicates that the temperature at the grate bars has never been very high, as it is soft and easily broken and removed. There is scarcely any side clinker, and such side clinker as is formed can easily be removed from the downstairs cleaning door. This company has operated for periods of two months at a time without barring down from upstairs.

During certain short periods of time, the Richmond company has operated another 8′ water gas set that is not equipped with the reversed blast process. This set has been operated for short periods of time only, but during these days the generator fuel and gas oil per M have been considerably higher than when the reversed blast set is operated. The capacity of this set is very much less than that of the set equipped with the reversed blast.

To sum up our opinion of the reversed blast, our experience would indicate:

First—That the capacity of the set has materially increased.

Second—That the generator fuel has been materially reduced.

Third—That there has been a slight reduction in gas oil per M.

Fourth—That the life of the checker brick has been prolonged.

Fifth—That the clinker is soft, brittle and easily removed and is planted close down upon the grate bars.

Sixth—That the hot valve, with its first cost, maintenance cost and inconvenience is eliminated from the set altogether.

The disadvantages in the employment of this process are not very serious and consist of the following:

First—The set has more valves, and therefore its operation is somewhat more complicated; but this does not make any great difference, especially with an automatically operated machine.

Second—There is a slow corrosion of all pipes and valves through which the reverse blast gases are passed or in the pipe leading from the outlet at the bottom of the generator to the inlet of the wash box.

Third—There is a hazard in connection with the employment of this process, if hazard it may be classed, which is not very serious. This same hazard exists in connection with all sets which are so piped that gas from the bottom of the generator is carried to the wash box without passing through the carburetor or superheater. We refer to the danger of air being admitted to the finished gas through a leaky valve at such a point that this air will be carried as air to the wash box and on to the holders. For example, suppose the generator blast leaks. During the reverse blast period, air through this leak enters and mixes with the low temperature gases on their way to the wash box. The oxygen of this air remains as oxygen because these gases never pass through a high temperature zone again. This condition does not exist in an ordinary water gas set, as any air leaking through any valve on such a set will pass with the gases through the checker brick and the oxygen content will unite with part of the combustible gas. Practically no oxygen will leave the set uncombined.

ANOTHER ASSOCIATION ADDED TO THE FAMILY

THE Executive Board of the American Gas Association at a meeting, September 16, 1925, approved the recommendation of the Committee on Affiliated Associations that the request of the Oklahoma Utilities Association for affiliation be granted. It is with pleasure that we welcome the Oklahoma Utilities Association as one of the sixteen associations and one geographic section forming with the national Association a co-ordinated organization working in the interests of gas.

Selling Easter Eggs and Gas Service

Rate Making from the View Point of the Customer

By C. S. REED, A. G. A. Rate Structure Committee

WE sometimes hear the statement that selling gas is just like selling any other kind of merchandise and that complicated rate structures are therefore unnecessary. If we went into a clothing store and asked the price of a collar, and the salesman told us that the original cost was five cents plus two cents for freight, plus so much for store rent, bookkeeping, lights, etc., plus so much for repairs and plus so much for profit, leaving it to us to add up the total, we would probably have left the store before he was through counting. Why, then, need the gas company talk about demand cost, customer cost, and similar mystifying and irritating figures?

Suppose, then, that we compare the gas business with some other form of merchandising. To use as simple an illustration as possible, let us suppose we are going into the business of selling Easter Eggs. We have bought 40 eggs at 1 cent each, a total of 40 cents. As containers for the eggs, we have also bought four small baskets at 10 cents each and one large one at 15 cents, making a total for baskets of 55 cents. We want to make a profit of 25 cents, so our total selling price will be 40 plus 55 plus 25, or $1.20. We are in the egg business exclusively. We have forty eggs to sell and $1.20 to raise. Our price is, therefore, 3 cents per egg.

If a man buys one egg, we will give him that egg, along with a basket, for the sum of 3 cents. If he buys 3 eggs, his payment, including, of course, a basket, will be 9 cents. If he buys 6 eggs, he will pay 18 cents; 10 eggs, 30 cents; and if he wants 20 eggs, we will give him the larger basket and charge him 60 cents.

Now, how long would we stay in business with such a scheme? Naturally, the man who wants only a few eggs will buy them from us because he gets a nice basket thrown in, while the big customer will buy his eggs separately from someone else, carry them home in a paper sack and get by on much less money.

It sounds very foolish when applied to the egg business, and yet lots of people would like to force the gas companies to charge for their product in just such a foolish way. In the gas business, the egg is a cubic foot of gas, or a thousand cubic feet, while the basket is the costly delivery system of mains and meters and their

attendant expense. Yet many people want the whole thing sold at so much per thousand.

The analogy can be made plainer by comparing the costs of serving individual customers of the gas company.

For instance, let us consider Doctor A, who lives in a high-priced apartment in a city where the gas rate is $1.20 per thousand cubic feet. Heat and hot water are furnished as part of the rent. All laundry work is done outside. There are only three adults in the family. Their breakfast is light and mostly prepared by an electric toaster and percolator. They lunch downtown and in the evening they are often out for dinner. The average monthly consumption of gas is about 500 cubic feet, for which Dr. A pays 60 cents.

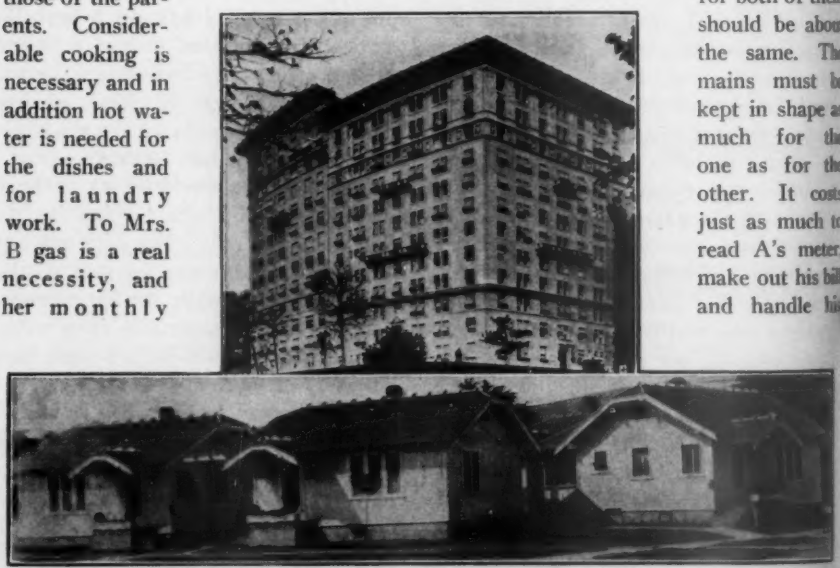
Next let us consider Mrs. B, the wife of a hard-working clerk living in a modest bungalow. There are five in the family, three healthy children's appetites being added to those of the parents. Considerable cooking is necessary and in addition hot water is needed for the dishes and for laundry work. To Mrs. B gas is a real necessity, and her monthly consumption is about 4,000 cubic feet, for which she pays $4.80.

The cost of the gas at the plant is not over 40 cents a thousand, so the bare cost of the gas furnished Doctor A is about 20 cents and of that sent to Mrs. B, $1.60.

Subtracting these figures from the total bills will give as contributions to the gas company, to cover all other expenses; such as pumping costs, lost gas, repairs to mains, services and meters, office expense, general expense, taxes, insurance, depreciation and the return to the owners of the property, the following amounts:

	Dr. A	*Mrs. B*
Gas bill	$0.60	$4.80
Less cost of gas	.20	1.60
Balance for all other costs	$0.40	$3.20

Returning to our analogy, we find that the egg cost for Doctor A is 20 cents and the basket charge is 40 cents, while Mrs. B is charged $3.20 for her basket. Yet the basket cost for both of them should be about the same. The mains must be kept in shape as much for the one as for the other. It costs just as much to read A's meter, make out his bill and handle his



The Family Below Is Eight Times Better as a Customer than the Family Above. The "Basket" for the One, However, Costs the Company Just as Much as for the Other.

account as it does for Mrs. B. The company's taxes, insurance, etc., are the same for both. It costs, therefore, excepting for the original cost of the gas itself, just as much to deliver 500 cubic feet to Doctor A as the 4,000 cu.ft. to Mrs. B.

What right has the Company to charge Mrs. B eight times as much for the same basket as Doctor A gets for his 40 cents.

It does not seem fair and yet, we ask ourselves, do not all other merchants have the same problem? The grocer has his delivery costs and his overheads but he hides them away in his commodity prices. Why cannot the gas company do the same? To properly answer this question, we should put the grocer and the gas company on the same plane and compare them.

How long could the grocer stay in business if all of his customers wanted their goods delivered at exactly the same time or if we were to ask him to be ready to deliver two cents worth of sugar any hour of the twenty-four and to put a scale in each kitchen to weigh the sugar? Another item of difference is that if a customer wants thirty pounds of sugar, delivered one pound per day, the grocer's delivery costs are thirty times greater than if he delivered the thirty pounds all at once. As for the gas company, however, the reverse is true. It costs the gas company more to deliver 3,000 cubic feet in one hour than it does to deliver 100 cubic feet a day for thirty days.

The humorists tell us kisses are like bottled olives in that after you get the first one the rest come easy. The same rule holds even more true in the gas business. After the first cu.ft. of gas is delivered to a customer, the rest comes easy.

These features make the delivery costs much higher than the production costs and so make the gas business different from other merchandising. Or, putting it in another form, the gas company has two commodities to sell—fuel and service—with the latter the more important. People can buy other fuels but it is the cleanliness and convenience of gas delivery service that count most.

The straight meter rate, charging by the thousand for gas and giving away the service, charging for the egg and throwing in the basket, is not only unjust and discriminatory, but it is the direct cause of the inability of the company to sell more gas to the ordinary residence user. When a gas company is forced to make an excessive profit on any class of customers to make up for losses on the others, it offsets the convenience features of its product and delivery service and the customer uses some other fuel. In other words, the customer buys his eggs elsewhere, and uses a paper sack instead of the fancy service basket of the gas company.

The critics tell us the gas business is a monopoly, but such is not the case. The gas company sells fuel in competition with the coal, oil and wood dealer. The only monopoly is in the delivery system. That is, the gas company delivers its fuel underground, without noise, wear and tear or interference with traffic, while its competitors use wagons that wear out paving, obstruct traffic and are dirty and noisy.

What would the clothing salesman tell us if, when asking the price of a collar, we also said, "We want you to have a collar out at our house every morning, noon, and night. Of course, there will often be times when we won't need a collar but we want you to have one ready in case we do. We don't promise to take any collars, but we will agree to pay for any that we do use."

If any other line of merchandising were asked to render the same kind of service asked of a gas company, it could not exist without a charge for such service.

Sectional Nominations for the New Year

THE American Gas Association has always been fortunate in obtaining the cream of the gas industry to serve on its general and sectional committees. That this high standard will be continued is assured by the following nominations of section chairmen and vice-chairmen which will be presented during the October Convention:

Technical Section: Joseph P. Haftenkamp, Rochester Gas and Electric Corporation, Rochester, N. Y., chairman; Walter C. Beckjord, American Light and Traction Company, New York, N. Y., vice-chairman.

Accounting Section: DeWitt Clinton, Worcester Gas Light Company, Worcester, Mass., chairman; Albert L. Tossell, The Peoples Gas Light and Coke Company, Chicago, Ill., vice-chairman.

Manufacturers Section: Watson E. Derwent, George D. Roper Corporation, Rockford, Ill., chairman; W. E. Steinwedell, Gas Machinery Company, Cleveland, Ohio, vice-chairman.

Industrial Gas Section: Frank F. Cauley, The Peoples Gas Light and Coke Company, Chicago, Ill., chairman; Charles C. Krausse, Consolidated Gas Electric Light and Power Company, Baltimore, Md., vice-chairman.

Publicity and Advertising Section: Frank LeRoy Blanchard, Henry L. Doherty and Company, New York, N. Y., chairman; Arthur W. Hawks, Jr., Consolidated Gas Electric Light and Power Company, Baltimore, Md., vice-chairman.

Commercial Section: Robert J. Canniff, Central Hudson Gas and Electric Company, Poughkeepsie, N. Y., chairman; J. J. Burns, The Laclede Gas Light Company, St. Louis, Mo., vice-chairman.

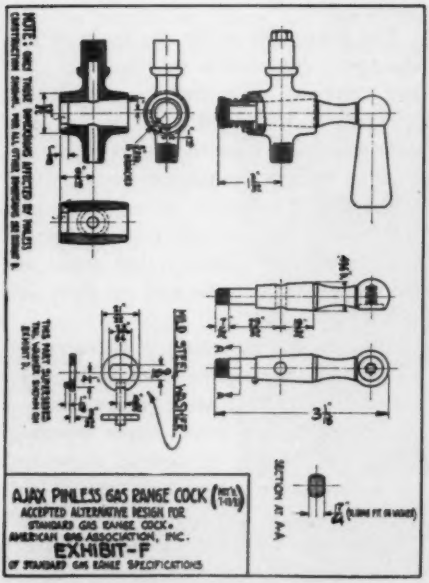


Fig. 1.

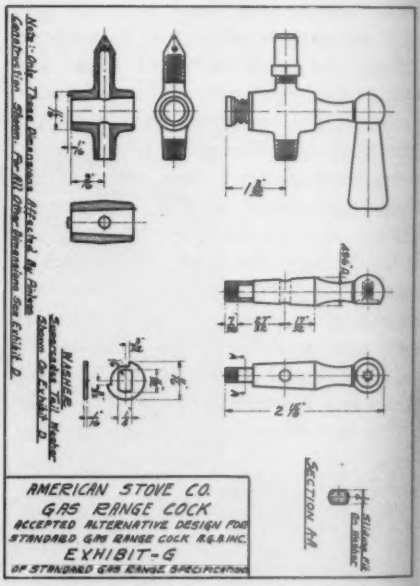


Fig. 2.

The two pinless gas cocks shown as in Figs. 1 and 2 have been approved by the General Specifications Committee as acceptable alternative designs for the Standard Stop Pin Cock shown as Exhibit D and E in the 1923 Standard Gas Range Specifications. When the Gas Range Specifications are again revised, these two designs will be included as Exhibits F and G respectively.

Steel Treating with Industrial Gas

THE first vertical gas-fired carbonizing machine ever to be installed in Chicago is now in operation at one of the city's largest printing press manufacturing establishments.

This company makes the highest grade printing machinery available. One of the principal parts to the ordinary printing press is a shaft 3 or 4 inches in diameter and 3 or 4 feet in length. That part of the shaft which rotates in the bearings must be "glass" hard. The remaining parts of the shaft must be of ordinary soft steel whieh can easily be machined. Robert G. Guthrie, chief metallurgist of the Peoples Gas Light and Coke Company, was called upon to design a furnace that would properly harden these big pieces of steel.

It soon became evident to Mr. Guthrie that the machine to do this work would have to be not only designed specially, but would require gas for the carbonizing agent. One of the finest methods known for hardening the surface of steel is to heat it in a retort filled with an abundance of unburned raw gas. The carbon content in the gas penetrates the steel, causing the surface to become extremely hard.

Mr. Guthrie went east to the home of the American Gas Furnace Company and there, with the aid of this company's staff of engineers, designed a furnace to accomplish this very difficult task of hardening printing press crankshafts. Up in a little room in one of the great New York City hotels, Mr. Guthrie and a staff of engineers labored under pressure one night until morning this last winter in order to have the machine completed at a specified time. These initial sketches were drawn with a stub pencil on wrapping paper. Today this massive machine is one of the most talked of steel-treating machines in the country.

The capacity of this great furnace is 3 shafts per day. The shafts are prepared and put into the machine in such a way that only those parts intended to be made hard are subjected to the carbonizing action. The process starts about 9:30 o'clock in the morning and continues all day. The next morning the furnace is again brought up to temperature and at 9 the shafts are removed and immediately immersed in a huge vat of ice-cold water. Thus the hardening operation is completed and the process is repeated.

Industrial gas produces a superior shaft. Production is speed and costs are reduced. This is just another illustration of how problems of the most intricate nature are solved only through the use of industrial gas.

It is interesting to note that although Chicago has enjoyed gas service for 75 years, it took the effort and study of experienced industrial gas metallurgists and engineers to design the proper furnace for its use in hardening steel shafts.

FOLLOWING the resignation of Charles L. Holman as vice-president of the American Gas Association, the Executive Board, at its meeting on September 16, unanimously appointed A. B. Macbeth of the Southern California Gas Company to fill out the unexpired term. Mr. Holman has severed his connection with the Laclede Gas Light Company of St. Louis, of which he was president, to accept an offer to become president of the Georgian Manganese Corporation of New York. The nomination of Mr. Macbeth as vice-president of the A. G. A. for the coming year will be presented to the Convention in Atlantic City this month.


1
2
3
4
5
6

When Industrial Gas Does a Man's Size Job

P. 590—(1) Rotary gas-fired carbonizing machines making agricultural implements. (2) Car-bottom annealing furnace. (3) Automatic hardening machine used for hardening lock washers. (4) Battery of stationary carbonizing furnaces. (5) Galvanizing furnace. (6) Group of lead hardening, cyanide hardening and oil tempering furnaces for heat treating steel.

P. 591—(1) Plunging printing press shaft into ice bath for hardening after heat treating by gas. (2) Battery of rotary carbonizing furnaces. (3) Heat treating cannon in Watertown (Conn.) arsenal. Temperature variation not more than five degrees. (4) Printing press shaft immersed in gas-fired machine heated to 1700° Fahrenheit.

A State Capitol Learns About Gas

UNUSUAL recognition has been extended to the Laclede Gas Light Company of St. Louis by the State of Missouri, which has borrowed from the Laclede and installed for temporary showing in the State Capitol a series of seven oil paintings depicting the evolution of heat, and an eighth portraying the discovery of St. Louis by Pierre Laclede, for whom the Missouri company is named.

The paintings, which are in oil upon wood veneer, are in the Maxfield Parrish style and

Science and Art Each Tells the Same Story in Its Own Way.

were painted for the Laclede by St. Louis artists last winter. They were used in the windows of the gas company in March to dedicate the remodelled merchandising floor of the Laclede Gas Building, a change made since Charles A. Munroe became Chairman of the Board.

Because mural decorations, costing close to $1,000,000 and painted by artists of international reputation, had been permanently installed in the Capitol, the approval of the Capitol Decorations Commission was insisted upon before the Laclede would loan its paintings. This approval, however, was freely given, and on June 22, Vincent M. Carroll, director of public relations for the Laclede, and S. C. Rieser, display manager for the company, installed the series in the marble halls of the west wing of the Capitol, where thousands since have viewed them.

PERSONAL ITEMS

CHARLES H. QUACKENBUSH, formerly general manager of the St. Clair County Gas & Electric Co., East St. Louis and Belleville, Illinois, and now general manager of the Wilmington (Del.) Gas Co., has been elected president of the Wilmington Advertising Club. Mr. Quackenbush has always been interested in advertising and just prior to his removal to Wilmington from East St. Louis conducted an institutional campaign for the St. Clair properties in the newspapers in Belleville, East St. Louis, Collinsville and Edwardsville, Illinois, that attracted the attention of gas men and advertising men all over the country.

H. LEIGH WHITELAW, formerly general manager of the A. H. Wolff Gas Radiator Company, was elected vice-president at a recent meeting of the board of directors of that company. Mr. Whitelaw has been associated with the A. H. Wolff Gas Radiator Company since October, 1923. In March, 1924, he was made general manager of this company. Mr. Whitelaw is a member of the American Gas Association, Natural Gas Association and Smoke Prevention Association. He is chairman of the Heating Appliance Division of the Manufacturers' Section, American Gas Association, and member of the sub-committee for the preparation of specifications on central house heating equipment.

WE BOW

To the Editor of the A. G. A. MONTHLY:

.....I want to take this opportunity to express my appreciation of the valuable information the gas industry is getting through the Association MONTHLY. We certainly have quite a flood of literature these days pertaining to the gas business, but I look forward each month to reading the MONTHLY, where valuable and up-to-date information is in a concise form.

Yours truly,
D. F. BURRITT,
Middle West Utilities Company.

Putting Baltimore's Municipal Affairs on a Business Basis

By JAMES S. KANE, Consolidated Gas, Electric Light and Power Company of Baltimore

James S. Kane.

THE plan of calling in an organization composed of the largest tax-paying interests to help administer the affairs of a municipal government is no doubt without parallel in the conduct of the affairs of any other city in this country. Nevertheless, this was the purpose of Mayor Howard W. Jackson of Baltimore, Md., who, on taking office in May, 1923, invited a group of the largest taxpayers to appoint representatives for a commission which would make a complete study of the operating methods of the municipal corporation and recommend plans for an efficient and economical administration.

Among those who accepted appointments to this commission were leading executives in many of the largest industries and public utility companies of Baltimore, among them Ezra B. Whitman of the Public Service Commission of Maryland, who was appointed chairman; William J. Casey, vice-president of the Continental Trust Company, vice-chairman; John J. Ekin of the B. & O. Railroad, John C. Kirk of the Pennsylvania Railroad, John C. Koons of the Chesapeake and Potomac Telephone Co., Arthur B. Lawrence of the General Electric Co., William H. Maltbie of the United Railways and Electric Co., Richard Mommers of the American Sugar Refining Co., Howard B. Pratt of the Western Maryland Railroad Co., George E. Probest, Jr., of the Bartlett Hayward Co., William Schmidt, Jr., of the Consolidated Gas Electric Light and Power Company of Baltimore, Thomas W. Stinglev of the Bethlehem Steel Co., and Abraham I. Weinberg of the American Wholesale Corporation.

The commission early organized into committees consisting respectively of Accounting, Finance, Engineering, Legal and Executive.

A SENSE of mutual obligation on the part of both city officials and privately owned public services to foster and uphold the economic strength of the whole community is increasingly becoming the mark of a progressive and up-to-date municipality. In his article, Mr. Kane emphasizes the fact that in all sane and constructive movements the modern utility man will be found laboring in the van.

THE WORK OF THE ACCOUNTING COMMITTEE

The Committee on Accounting was organized under the chairmanship of William Schmidt, Jr., secretary and assistant treasurer of the Consolidated Gas Electric Light and Power Company of Baltimore.

The duties assigned to this committee were to investigate the system of accounting and record keeping used in the various city departments, and wherever the system was found inadequate, obsolete, or accomplishing no useful purpose, to devise a modern system and to supervise its installation.

It was realized that the task was an enormous undertaking. In order to complete the investigation of forty-five city departments, together with nine subdepartments, within a reasonable time, it was decided to recruit a force of twenty-five trained accountants from the various organizations represented on the Commission.

The work was started by the preparation of an accounting questionnaire of approximately four hundred questions. The nature of these questions covered every phase of accounting in the city departments.

The results of the survey were turned over to a Committee on Summarization, who were charged with the task of summarizing the reports. A study of this summarization showed that a great deal of the accounting work could be performed more efficiently and economically if classified and consolidated in several bureaus.

The following are the principal classes of work which the Committee felt could better be performed in central bureaus:

Timekeeping and Preparation of Payrolls.
Paying Employes.
Billing and Collection of Revenues.
Accounting for Disbursement of all cash

and budgeting of all Departmental Appropriations.

Cost and Statistical Accounting.

General Accounting.

CENTRAL PAYROLL BUREAU AND PAYMASTER'S BUREAU

The first step toward centralizing the accounting work was in the appointment of a sub-committee to make a special study of the methods of timekeeping, preparation of payrolls and the paying off of approximately 12,000 employees.

The members of this committee had many years of experience in payroll work and were familiar with payroll practices in use in a number of large organizations.

After a careful study of the payroll methods used in the various city departments, this committee submitted a report recommending the preparation of all payrolls in a central bureau reporting direct to the Comptroller, and also that all city employes be paid through a Central Paymaster's Bureau reporting direct to the City Register, thus eliminating the preparation of payrolls and paying off of employes by forty-five departments.

This report was presented to the Mayor and adopted, after which the payroll committee began the task of putting their plans in operation.

Wm. Schmidt, Jr., of the Consolidated Gas Electric Light and Power Company, Chairman of the Committee on Accounting.

The central bureaus were organized in February, 1924, and at the present time are preparing the payrolls and paying off all the city employes with the exception of the Park Board. Plans are now in progress for taking over the Park Board Payroll, and after this is done the Central Payroll and Paymaster's Bureaus will be handling the entire payrolls of the city, involving the disbursement of approximately $17,000,000 annually.

The new system has many outstanding advantages over the old one, but probably the most important point is that the payroll procedure is now being handled in a uniform way, whereas under the old system forty-five separate departments were handling payroll matters according to their own ideas without a thorough check being made at any one central point. It is certainly true that, with all the payroll work centralized, the Mayor, Comptroller, City Council and other city officials should feel that payroll expenditures for which they are responsible are safeguarded to an extent that was absolutely impossible under the old methods. The Committee in its investigation found a number of irregularities in the payrolls, all of which were brought to the attention of the departments in which the irregularities occurred. In view of the fact that payroll disbursements approximate $17,000,000 annually, it is not only good business practice, but should be considered absolutely necessary, to have a closer supervision and check than was possible heretofore.

BUREAU OF RECEIPTS

The city had a number of departments billing and collecting revenues, chief of which were the Tax Department, Collector of Water Rents and Licenses Department and the Comptroller's Office. It was deemed advisable to have one central bureau for this purpose, to be known as the Bureau of Receipts.

To accomplish this a committee was selected, consisting of accountants connected with the revenue departments of their respective companies, wherein are handled accounts of several hundred thousand customers.

To this committee was assigned the task of making a thorough study of the revenue producing agencies of the city and submitting plans for the organization and operation of a central bureau to handle all revenues accruing to the city, which, for the year 1925, will total approximately $38,000,000.

After a study lasting several months, which included visits to the municipal departments of Chicago, Philadelphia, Washington (D. C.) and Wilmington (Delaware), the Committee submitted a report covering a complete system for the billing and collection of all city revenues.

This system was a radical departure from the system previously used by the city for the billing and collection of revenue. It was subjected to a critical review, not only by accountants familiar with the billing and collecting of revenues on a large scale, but also by many city officials. There were a number of questions raised as to the successful operation of this system, all of which were satisfactorily explained by the Committee. The report was submitted to the Mayor and adopted to be put into effect as of January 1, 1925.

The new system provides for controls which will detect clerical errors and also bring to light any tampering with the taxable basis and amounts billed and paid. Under the old system, which contained no controls, it was impossible to accomplish this.

The installation of this new system was probably the largest accounting job ever undertaken in the City of Baltimore. When it is realized there were over five hundred thousand accounts involved and that the change was a radical departure from practices that had been in force over a long period of time, some idea can be obtained of the enormous size of the job. Lack of a suitable starting basis and faulty records made the change to the new system extremely difficult. The training of employes to new and more exacting methods, opposition, both open and passive, on the part of some employes, were handicaps in getting the work started. However, in the face of these and other obstacles which could not be foreseen, the collection of current revenues under the new system began on January 19th, 1925, which was about one month earlier than in previous years. The public may now pay its bills for all charges at one place on the first floor of the City Hall, and they are handled with greater rapidity than under the old method.

While the accounting survey force was making its investigation they discovered a large number of delinquent accounts on the city books and the lack of a systematic method for the collection of the same.

As there were no records which showed the amount of accounts receivable due the city, several members of the accounting survey force were assigned to the task of ascertaining the amount of delinquent accounts. It was found that there was over $11,000,000 in delinquent accounts due the city as of August 1, 1923, and covered taxes, water rents and miscellaneous charges for several years back. A number of these charges were already uncollectible as they were beyond the period covered by the statute of limitations.

The Accounting Committee determined upon a plan for an intensive drive by all departments concerned for the collection of these delinquent accounts.

There was temporarily organized the Bureau of Delinquent Accounts, to which was assigned the task of collecting miscellaneous charges. This resulted in the collection of a large number of old accounts.

Airplane View of Baltimore's Gas and Electric Company.

It was found that a number of owners of motor vehicles in the city had neglected to pay taxes and that many of them had successfully avoided these payments over a period of years. Legislation was enacted at the 1924 session providing that no motor vehicle tags should be issued by the Commissioner unless he was satisfied that taxes in arrears had been paid. Representatives of the Accounting Committee then prepared a plan of procedure under which the Collector of Taxes certifies as to payment. The plan has been successful in operation, and the legislation has resulted in the collection of many thousands of dollars which otherwise would have been lost to the City and State Treasury.

The result of these collection drives against delinquent accounts was that during the year 1924 the amount paid on delinquent accounts was in excess of $5,600,000.

BUREAU OF DISBURSEMENTS

A sub-committee was appointed to make a detailed study of the system used for disbursements and budget accounting, and make

such recommendations as were necessary to properly control the payment of the large amounts of money expended by the city.

The members of this Committee were especially qualified for this class of work, having had considerable experience in disbursement accounting in railroad and large industrial corporations.

Prior to the completion of the Committee's report, they visited and made an examination of the systems used in nine municipalities and corresponded with twelve others. The system this Committee recommended for adoption follows very closely the plan in use in the office of the Comptroller General of the United States Government.

Under the old system there was no central point in the city to which all invoices were forwarded by vendors, so they could be properly recorded and followed up until payment was made. There was also no attempt made to see that the city took full advantage of cash discounts offered for prompt payment of invoices. Each department prepared its own vouchers and made the distribution of charges to their budget appropriations. This work in turn was duplicated to a large extent in the Comptroller's office where checks were prepared and a separate distribution made against the budget appropriations. The Comptroller had no record of bills held in the various city departments, and consequently had no idea of the amount of the city's liability for unpaid invoices. The Comptroller's budget records were kept strictly on a cash receipt and disbursement basis, and no attempt was made to encumber the various appropriations with commitments and other liabilities. Under all of these conditions it was difficult to keep track of the status of accounts payable, and there existed as a constant danger the possibility of paying the same bill twice. Examples of duplicate payments were brought to our attention and generally did not become known until the vendor returned the second payment to the city.

Under the new system all invoices are forwarded direct to the Bureau of Disbursements by vendors. This will permit a complete control of all invoices rendered against the city and put the city officials in a position to take advantage of every cash discount offered for prompt payment, as well as safeguard the city against duplicate payments. The results so far obtained have fully demonstrated the wisdom of this policy.

The new system provides for the preparation of vouchers and checks with one writing and to furnish department heads with statements from time to time showing the status of their appropriation accounts. This will eliminate considerable duplication of work.

The new plan further provides for the encumbering of appropriations with commitments and other liabilities as soon as incurred, so that when a budget report is rendered it will present a true picture of the status of every appropriation, whether the cash has actually been disbursed or not. All orders and contracts are referred to this bureau and certified as to sufficiency of appropriation before they are awarded.

The controls in the Bureau of Disbursements upon expenditures made and to be made, together with the controls established in the Bureau of Receipts upon revenues collected and to be collected, should effectually prevent any deficit in the operation of the city such as has been encountered in the past.

This bureau started to function on January 1, 1925, and has been completely organized for several months.

COST AND STATISTICAL ACCOUNTING

The accounting survey disclosed that considerable cost and statistical accounting was performed in several departments. It is felt that duplication of work can be saved and more useful information obtained, if all work of the above nature were centered in one bureau. Centralization of this work would also permit the use of mechanical appliances, thereby eliminating a great deal of the work now being done by hand. This bureau will also maintain a record of all property owned by the City of Baltimore. This is something which the city has never known. An inventory of all the city's property is now being taken. This inventory will be used as the basis to which will be added all subsequent property additions, and from which will be deducted all property sold or otherwise disposed of, thereby having available at all times a detailed record of the fixed capital owned by the City of Baltimore.

A committee is now making a further detailed study of this work and it is expected to have the bureau organized by the end of the year.

As soon as all of the accounting work outlined in the preceding paragraphs is under way the groundwork will be laid for the

preparation of a balance sheet showing all the assets and liabilities of the City of Baltimore, to be supported by such detailed schedules of assets and liabilities as are deemed necessary.

The General Accounting Bureau will also maintain such control accounts as are deemed advisable, these control accounts to be supported by detail accounts in the various departments.

A committee is now engaged in preparing detail plans for this bureau and it is expected to have the bureau in operation by the end of this year.

An important feature of the plans of the Accounting Committee will be the recommendation of an Auditing Bureau reporting direct to the Mayor, modelled after the auditing bureaus of several of the large railroads and public utilities.

The scope of the work to be accomplished by this bureau has not been fully developed. A committee is now being organized to study the auditing work necessary to be performed in the municipal departments and this report will probably be prepared in time to have the bureau functioning by the end of the year.

The Committee on Accounting have appointed a special sub-committee to consider the advisability of organizing a central bureau for the receipt and issuance of applications, permits and licenses. Under the present system applicants are required to apply at numerous departments to transact business of this nature. It is proposed to have one place where applicants will apply and where permits and licenses will be issued, thereby saving considerable time for and facilitating the movements of applicants. A report has been prepared and submitted by the sub-committee, and when accepted the work of organizing the bureau will be started.

This same sub-committee has also submitted a report recommending a central service bureau to handle all complaints and inquiries, as it is felt such a move will tend towards public good-will. This report is now in the hands of the Mayor's Commission and is receiving their consideration.

THE WORK OF THE FINANCE COMMITTEE

The Finance Committee is headed by William J. Casey, vice-president, the Continental Trust Company.

This committee took up the question of the entire financing of the city and gave particular attention to the following subjects:

Overfeeding of Sinking Funds.
City Markets.
Pensions for City Employes.
Central Purchasing Bureau.
Appeal Tax Court, Bureau of Minor Privileges and Commissioner for Opening Streets.
Coupon Bond Form for City Obligations.

The plan adopted by the Committee for the elimination of appropriations to sinking funds which were overfed has resulted in a reduction of approximately $900,000 in the annual levy for sinking funds purposes.

An investigation of the city markets developed the fact that the rentals received therefrom were insufficient to take care of the maintenance of these properties, and that they were a burden on the general tax levy. A number of recommendations were made for the purpose of putting the markets on a self-supporting basis, the most important of which was the revision of the rentals. Since the revision of the rentals by the City Comptroller, the annual tax levy has been relieved to an approximate amount of $100,000 a year.

THE WORK OF THE ENGINEERING COMMITTEE

The Engineering Committee was under the chairmanship of Arthur B. Lawrence, manager, Baltimore Works of the General Electric Company.

After preliminary studies the Engineering Committee decided that a thorough and detailed study of the city departments was necessary. A very complete and comprehensive questionnaire was prepared to develop the information and data required. A field survey and advisory force was organized, consisting of forty-two trained representatives from the large industries in the city.

As the result of two independent studies, the Department of Public Works was evolved. The Engineering Committee then prepared reports covering Chief Engineer and Staff, and each of the proposed eleven bureaus. These reports included the detailed organizations of the existing departments and bureaus; tentative divisional organization for the proposed bureaus; analyses of the existing departments and bureaus, the scope and volume of their activities, and the legal provisions under which they operate. Analyses of the proposed bureaus were developed showing the makeup of the bureaus, and assignment of duties and activities under a uniform classification developed by the Committee in its studies.

It was the desire of the Engineering Committee to bring the present department heads

into the work and secure their co-operation in the development of the final detailed working plans. Accordingly, sub-committees were appointed for the completion of the work and were assigned as follows:

Chief Engineer, Bureau of Water Supply, Bureau of Highways, Bureau of Sewers, Bureau of Harbors, Bureau of Mechanical-Electrical Service, Bureau of Buildings, Bureau of Street Cleaning, Bureau of City Plan, Bureau of Standards, Bureau of Transportation, Bureau of Stores, and Shops.

The establishment of the Department of Public Works should be of great and lasting benefit to the City of Baltimore. Aside from any reduction in overhead organization costs, the establishing of proper organization, procedure, and routing of work should produce considerable savings in the expenditure of the large amounts of money spent annually by the engineering and construction departments.

The keynote to the proposed plan is co-ordination of work, elimination of the duplication of effort, and the definite placing of responsibility.

This plan furnishes engineering supervision and service for the non-engineering departments, notably, the Bureau of Street Cleaning, and also the Park Board, whose close co-operation with the proposed Bureau of City Plan should prove to be of great benefit to the City of Baltimore.

The Commission of Public Works plan makes the Chief Engineer the active directing head of a major department, consisting of several bureaus.

THE WORK OF THE LEGAL COMMITTEE

The work of the Legal Committee was largely handled by the chairman, William H. Maltbie, in conjunction with the City Solicitor. This work in its early aspects consisted of the interpretation and construction of various sections of the city charter and local laws, as applying to the various activities of the Commission in dealing with the great variety of subjects that were under consideration.

An important phase of this work was the formulation of the policy of the Commission in respect to amendments of the city charter. As finally determined, this provided for a blanket amendment to the charter, conferring upon the Mayor and City Council the authority to reorganize and consolidate various activities of the city government, excluding, however, the Public Improvement Commission and the City Service Commission.

This blanket amendment was embodied in an ordinance prepared by the City Solicitor in conference with the chairman of the Legal Committee. This ordinance was passed by Council and submitted to the voters of the city, which was done at the general election in 1924, and ratified by a large majority.

THE WORK OF THE EXECUTIVE COMMITTEE

This committee was composed of the chairman and vice-chairman of the Mayor's Commission and the chairmen of the Accounting, Finance, Engineering and Legal Committees.

This committee received and reviewed the reports from the group committees and after their endorsement transmitted them to the Mayor for his approval and acceptance. In addition to this, the Executive Committee undertook some special studies that did not fall within the scope of group committees. These are summarized as follows:

A Self-supporting Water Service.
City Service Commission.
Standardization of Salaries and Wages of Municipal Employes.
Care, Custody and Maintenance of City Buildings.
Capital Expenditures made by the City.
Municipal Telephone Service.
Proposed Municipal Office Building.

Much has been accomplished as the result of the Commission's efforts and they have played no small part in the reductions in the tax rate which have been brought about since the Commission was organized in 1923. The tax rates have been as follows:

Year 1923	$2.97	per $100
Year 1924	2.90	per 100
Year 1925	2.58	per 100

A still further reduction is looked for in the year 1926.

"Service is the golden rule melted down to one golden word."—
Gas Purifying Materials Company, Long Island City, New York.

What the Laboratory Has Accomplished

And What It Is Doing Now

By R. M. CONNER, Director Appliance Testing Laboratory

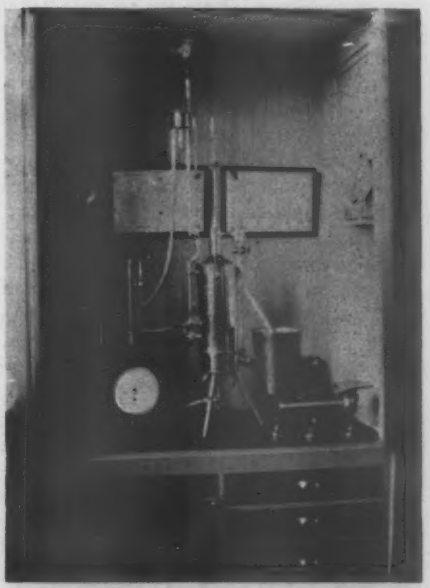
Beginning Research Work on Gas Ranges.

AFTER the Great War was over, Sir Philip Gibbs, famous war correspondent said, "Now it can be told," and the same thing can now be said of the A. G. A.'s Testing Laboratory in Cleveland. We can really say for the first time that the first chapter is being written. If the introduction and preface seemed a little long-drawn-out, we can take our reward today in the sense of pride that comes from an artisan's handiwork which has met all expectations.

From now on we shall have to stop talking about what the Laboratory is going to accomplish, because there is so much that has been and is being done to occupy our interest. You will be interested to know that all tests on samples supplied by manufacturer members on flexible gas tubing have been completed, marking the Laboratory's first definite accomplishment in the work for which it was established. Test reports have been prepared covering our findings, and a list of tubing samples which have met A. G. A. requirements appear on the following page.

The next item on the program is the preparation of appliance specifications on which the various sub-committees are now busily engaged. Such excellent progress is being made in this work, that it is not improbable that the final revision of specifications on gas ranges will be ready for adoption by the time of the Convention. This type of appliance was chosen first because specifications on it need only revision and will doubtless be completed before any others are ready.

The Laboratory Managing Committee has outlined a very definite program for our first year's operation. This policy seemed absolutely necessary in view of the great importance placed on the necessity of speeding up the work of appli-



Calorimeter Equipment, Furnished by American Meter Company, Installed in A. G. A. Laboratory.

ance selection. The Laboratory's present schedule calls first for the completion of proposed research work on gas ranges, space heaters, water heaters, central house-heating appliances; and second, completion of routine testing work on gas ranges.

One of the most important recent items of news in connection with the Laboratory is the adoption by the City of Baltimore of an ordinance specifying that all appliances sold or offered for sale in that city shall conform to the specifications of the American Gas Association. Baltimore is to be congratulated on this most constructive and complete measure, which, it is anticipated, will do a great deal to safeguard the public's interests by excluding the sale of unsatisfactory gas appliances. The A. G. A. will, of course, be represented on the Gas Reference Committee of Baltimore,—an important step if matters between the city and ourselves are to be properly co-ordinated.

Approval of gas appliances for national use offers some rather difficult research problems. There are roughly 2,000 manufactured and natural gas companies in the United States serving a large number of different qualities of gases at various pressures. The terms natural, mixed, oil, coal, coke oven and carburetted water gas, are general and do not indicate the number of different qualities of gases supplied in each group. In fact, it is rather difficult to find two gases possessing exactly the same constituents. Changes in pressure, specific gravity, and heat content all influence appliance operation. To develop a series of tests that will indicate satisfactorily the operation of an appliance under all conditions of service offers a rather complicated problem.

While not yet fully developed, our research plans should eventually prove of great value to manufacturers.

Mr. Milener, chairman of the Central House-Heating Appliance Committee, held a meeting of his committee on Aug. 24. Considerable progress was made and another meeting has been arranged in the near future. Some exceedingly interesting matters were discussed, and while it cannot be definitely stated at this time, it is thought that such portions of the A.S.M.E. Code as apply to gas boiler construction will be adopted with little change. This plan has several distinct advantages, the most important of which is the fact that manufacturers will not be inconvenienced by having to construct appliances to conform to several different requirements.

Mr. Stephany, chairman of the Space Heater Committee, held a meeting in New York at Association Headquarters on September 18th. His sub-committee is the largest of the five now formed and includes members of several governmental bureaus as well as representatives of the gas companies and appliance manufacturers. The whole gas industry will watch with interest the work of this body. The preparation of satisfactory construction and performance specifications for space heaters is regarded by the gas industry as one of the most difficult problems facing them in this class of work. Manufacturers are equally represented on this group and are availing themselves of the opportunity to prepare specifications which are not only satisfactory for the present but will anticipate their future requirements.

Practically all of the initial equipment requested from manufacturers has been received and installed. A large portion of it is now in service.

AT the present writing the Laboratory has approved the following samples of flexible gas tubing:

TYPE	MANUFACTURED BY
3/8" Gaspruf Stove Tubing with Eureka Ferrules	Atlantic Tubing Co.
5/16" "W" Gas Tubing with Eureka Ferrules	Atlantic Tubing Co.
5/16" Gaspruf Stove Tubing with Eureka Ferrules	Atlantic Tubing Co.
5/16" Evertite Tubing with Aluminum Ferrules Clamped on	Eastman Mfg. Co.

Manufacturers who assisted the American Gas Association in this manner, and the apparatus they furnished, follow:—

Company	*Apparatus Donated*
American Meter Co.	1—Hinman Junkers Calorimeter
	1—Specific Gravity Apparatus
	2—Stop Watches
	21—6″ U Gauges
	1—1/10 cu.ft. Wet Test Meter
	1—5 Lt. Wet Test Meter
	3—10 Lt. Wet Test Meter
	1—20 Lt. Wet Test Meter
The Bristol Co.	1—Recording Pyrometer (0-3600°F.)
	1—Recording Pressure Gauge (0-50 lbs.)
	1—Recording Pressure Gauge (0-12″ water)
Chaplin Fulton Co.	2—1″ Air Pressure Reducing Valves
Cleveland Gas Meter Co.	6—5 Lt. Tin Type Dry Gas Meters
	2—30 Lt. Tin Type Dry Gas Meters
Crane Company	13—4″ Standard Pipe Gate Valves and Flanges
Eclipse Fuel Engineering Co.	1—Eclipse Water Still
Equitable Meter Co.	6—1″ Low Pressure Regulators
	3—1¼″ Low Pressure Regulators
	3—2″ Low Pressure Regulators
Foxboro Co. Inc.	1—Recording Pressure Gauge (0-12″)
	1—Recording Pressure Gauge (0-50 lbs.)
Metric Metal Works	3—Calorimeter Thermometers, Inlet & Outlet. B. S. Cert.
	3—Calorimeter Thermometers, Outlet. B. S. Cert.
Mine Safety Appliances Co.	1—Pyrotannic Block Detector Set
Pittsburgh Meter Co.	6—"U" Gauges (0-18″)
Republic Flow Meter Co.	1—Indicating Pyrometer
P. H. & F. M. Roots Co.	1—No. 3 Acme Compressor
Ruud Mfg. Co.	1—100 gal. storage Water Heater
U. G. I. Contracting Co.	1—Chemical Balance
	1—Hygrometer (Wall Type)
	2—Sling Psychrometers

Leaders of our industry, in discussing laboratory plans, agree that the establishment of the Laboratory is a significant forward step, and are agreed that the value of testing and appliance research work cannot be overestimated. Gas appliances are our mediums of service. The manner in which they perform is sure to influence our customers in forming their conclusions regarding the quality of our service.

OUR NEW MEMBERS

MANUFACTURERS

Public Service Stock & Bond Co., Newark, N. J.

The New Method Stove Co., Mansfield, Ohio

The Cleveland Trencher Co., Euclid, Ohio

Sorco Manufacturing Co., Scranton, Pa.

Andes Range & Furnace Corp., Geneva, N. Y.

Sullivan Machinery Co., Chicago, Ill.

Victaulic Co. of America, New York, N. Y.

ACTIVE MEMBERS

Leonard, William Moeker, Kings County Lighting Co., Brooklyn, N. Y.

Albright, Raymond Claude, Allentown & Bethlehem Gas Co., Allentown, Pa.

Kelley, James E., Western States Gas & Electric Co., Stockton, Calif.

Johnstone, Clifford, Pacific Coast Gas Association, San Francisco, Calif.

Ryerson, William Newton, United Gas Improvement Co., Philadelphia, Pa.

Cummings, Carl Herrick, Industrial Appliance Co., Boston, Mass.

Cushing, Stanton B., Public Service Co. of No. Ill., Chicago, Ill.

Cushing, Thomas E., Philadelphia Suburban Gas & Electric Co., Chester, Pa.

Bergman, Ted, New York & Richmond Gas Co., Stapleton, S. I., N. Y.

Locke, Charles A., Kings County Lighting Co., Brooklyn, N. Y.

Grafton, Fred D., Kings County Lighting Co., Brooklyn, N. Y.

"Taking the Broadest View Possible"

By THE EDITOR

WHERE shall we hold the 1926 Convention of the American Gas Association? It is true that we are only just about ready to hold the 1925 Convention, but anyone who believes it is too early to think or talk about next year need only be referred to the mass of correspondence on the subject which is being accumulated by Alanson P. Lathrop, chairman of the A. G. A.'s Time and Place Committee. Thirteen cities in the east, west and middle west sections of the country, not to mention the north and south, have already sent Mr. Lathrop their application to be considered as the headquarters of our meeting. Who said, "nobody loves a gas man"?

Where do you think we ought to go? This is the fourth year we have gone to Atlantic City; yet a number of our members seem willing to make it our permanent headquarters. Certainly we have learned our way around there. A considerable sentiment, however, is asking for a change.

The Chicago Chamber of Commerce is offering accommodations in "the windy city." California is calling many. Cape May, N. J., will place its large convention hall on the Municipal Pier at our disposal free of charge. Cincinnati promises not to increase its hotel rates on us. Montreal has an argument or two worth considering. Detroit *knows* that 80 per cent of the gas men in this country would like to go there. New York City will have its New Madison Square Garden completed by that time. The convention service offered by Memphis, Tenn., is guaranteed to be "scientific", which probably means something. Philadelphia is willing to take us on in spite of the Sesqui-Centennial Celebration and even offers to house our exhibit in the Industrial Building of the Centennial, a la Wembley. Washington, D. C., promises to keep its temperature down to 70 degrees Fahrenheit. Milwaukee at least offers memories; and West Baden, within twenty-three miles of the centre of population, has facilities enough to house all our members under one roof. Take your choice. The Committee wants your suggestions.

INDUSTRIAL gas salesmen will find familiar echoes in a recent editorial in *Electrical World* wherein objection is taken to the "cloak of mystery" thrown by many heating engineers about the methods used and results obtained with various types of industrial heating.

It is still all too difficult to get good operating data on a number of important installations, and this condition is not likely to improve until manufacturers appreciate the advertising value which the use of gas fuel offers. These advertisable qualities were eloquently indicated by Horace H. Clark in the September issue of the MONTHLY.

More significant than this, however, was the more or less unconscious tribute which the editor of the *World* paid to the recent work of our Association.

"Possibly," he said, "the propaganda of the gas association may cause the manufacturers of electric heating apparatus to see the light."

IT may be a little late for 1924 year books, but there are a few paragraphs from the report of the Public Service Company of Northern Illinois that, we think, deserve a little wider publicity. We read, then, that:

Public Service Company now serves 25 per cent of the gas users in Illinois outside of the city of Chicago. Surveys made by the Illinois Commerce Commission show that for the entire state, exclusive of Chicago, an average of one out of every 4.7 persons living in areas where gas is available is a gas user, while in the territory served by the Public Service Company one out of every 4 persons is a gas customer.

This remarkable increase in the use of gas is seen, not alone in the greater number of users, but, also, in the higher consumption per customer. During the year 1924 Public Service Company customers used an average of 40,472 cubic feet of gas each. This is 9,764 cubic feet, or 31.8 per cent more, than the average found by the Illinois Commerce Commission for the entire state, exclusive of Chicago.

In the growth of the industrial gas business, the results have been particularly noticeable. Within the last year the company's in-

Niles Gas Station of Public Service Company of Northern Illinois.

dustrial gas engineers have co-operated in the successful application of gas to many important manufacturing processes. Gas-fired kilns for the brick-burning industry, the use of gas for the "cracking-off" process in glass making, the replacement of steam with gas in starch cooking, and the direct gas firing of asphalt stills, are examples of what has been done toward broadening the industrial usefulness of gas within the territory served by the company during the past year.

A division which has done much for the promotion of harmonious customer relationship is a Home Service Department. This department under the supervision of a trained lecturer on domestic science and housekeeping problems carries on work among the women by means of periodical cooking schools. Twenty practical demonstrations were given during the year in as many different communities, and all were enthusiastically received by the women. Approximately 12,000 women attended these demonstrations throughout the year, and carried with them, when they left, not only useful information on cooking and housekeeping problems, but also a favorable impression of the company which supplied this service free of charge.

Early in the year a new Department of Public Relations and Service was created under the direction of Vice-President Charles W. Bradley, formerly assistant to the president.

Use of the company's transportation equipment as a medium for advertising was adopted during the year with marked success. The company has 115 motor trucks in constant service and these were utilized to carry posters conveying timely messages to the public. This has proved a valuable as well as an inexpensive form of advertising. For example, in the moving season the trucks carried posters with the words: "Going to Move? Phone Us for Service at Your New Address."

Charles J. Fox

Chas. J. Fox.

CHARLES J. FOX, distribution superintendent of the Philadelphia Suburban Gas and Electric Company at Darby, Pa., died August 18th from a complication of diseases. Mr. Fox had been confined to his home for several months, and although he showed improvement from time to time, he suffered a stroke of apoplexy some weeks ago which hastened the end.

Mr. Fox had a record of over twenty-six years of continuous service, during which time, until his illness, he had not missed a day at his work. He became associated with the gas industry April 15, 1899, at which time he joined the staff of the Darby District of what was then the Philadelphia Suburban Gas Company. At that time the Darby District was serving about sixty customers and had a mile and a half of main. Mr. Fox, through untiring effort and ceaseless energy, developed the territory until today this district comprises 17,759 meters and 287 miles of main.

Mr. Fox is survived by his widow, Mrs. Rebecca L. Fox. Funeral services were held Saturday afternoon, August 22nd, from his late residence in Fernwood. Interment at Arlington Cemetery, Upper Darby, Pa.

IT BECOMES my sad duty to announce the death of

Dr. Charles F. Chandler

which occurred in the Hartford Hospital, Hartford, Conn., August 25th, 1925. Funeral in St. Thomas's Church, Fifth Avenue and Fifty-third Street, Friday, August 28th, at 2 o'clock.

Dr. Chandler was elected an honorary member of the Society of Gas Lighting at its first meeting May 4th, 1876; he became deeply interested in its formation, an interest which continued until his death.

GEO. G. RAMSDELL, *Secretary.*

Proper Meter Connections for Testing Uniform Capacity

By WM. A. CASTOR, United Gas Improvement Co.

THE necessity for careful observation of details in the method employed in determining the cubic feet per hour gas capacities of gas meters has been demonstrated to us recently.

In the report of the 1922 Consumers' Meters Committee the methods of procedure were covered at great length.

The Committee recommended the use of air as the testing medium; the differential between meter inlet and meter outlet to be five-tenths of an inch water column. The results thus obtained were to be increased by twenty-five per cent for the purpose of determining the gas capacities at which to badge the meters. To obtain the differential pressure a differential pressure gauge, connected across the meter inlet and outlet as close to the meter as possible, or separate pressure gauges connected to the meter inlet and to the outlet connections, as close to the meter as possible, were specified.

These specifications were all right as far as they went, but they did not cover the vital points to be observed in order to obtain results that reasonably could be accepted as true, and that would stand comparison with results obtained by other persons using their own connections and gauges.

A new sample 60-A meter, containing enlarged diaphragms and lightened valves, was sent to our shop recently for the purpose of determining its hourly capacity. The results obtained were not the same as those obtained by the manufacturer, as a matter of fact we obtained 143 cubic feet less.

In the endeavor to determine the reason for this difference, the meter was re-

Exterior View of Meter Hookup for Testing.

tested by both parties concerned, each using both sets of connections and gauges, but the results were negative, both parties obtaining about the same difference in capacity when using the different connections and gauges.

The meter maker's inclined differential gauge take-off connections were tapped off 60 lt. *brass* meter unions screwed on the 60-A meter screws. The tail pieces of these unions were free of lumps or rough spots and were of the same internal diameter, presenting fairly smooth uniform gas ways. The take-off connections were taken off midway between the top and bottom edges of the tail pieces and did not project into the gas ways and in the tail pieces. The same arrangement was followed by us, the tail pieces, however, were black malleable iron, representing the run-of-stock unions, and presented rough, irregular surfaces to the gas flows.

After many changes in the manner of taking off the connections to the differential gauge, and numerous changes in the fittings into which the tail pieces were

screwed, and finally, after dressing the gas ways of the iron tail pieces, capacity results were obtained that corresponded to those originally obtained by the meter maker.

The investigation brought out conditions which warrant the following statements:

Pressure gauge connections should be taken off the mid-section of the inlet, and off the outlet tail piece of the meter unions, attached to the meter screws of the particular meter under test. Each take-off nipple should be about four inches long, should not extend into the gas way of the tail piece, and should be attached to a one inch inclined differential gauge by means of a short piece of rubber hose. The length of hose should be the same for both inlet and outlet connections, and no cocks or fittings should be used in either connection. If separate gauges are used, the method of connecting them should be identical. The point is that each connection of a pair must be the same, but it is not necessary that each pair of connections must be the same as every other pair of connections.

The tail pieces to which the gauge connections are made should be of the same length, should have their gas ways machined to present a smooth surface to the flow of gas, and the inlet and outlet tail pieces of any pair should be of the same internal diameter, but this diameter need not be exactly the same as that of any other pair of tail pieces for the same size of meter screw. The top and bottom edges of the gas ways should be chamfered, or better, slightly tapered to remove any rough edges and improve the gas ways.

A pair of carefully machined tail pieces with take-off nipples tapped and soldered to them should be made up for each size of meter screw on the meters to be tested, as only in this way can it be assured that the maker and the purchaser of meters will obtain capacity results that are comparable.

We believe the arrangement of the fittings into which the tail pieces are screwed, in making up the meter inlet and outlet connections, have little or no bearing on the capacity results obtained, although it is logical to have them of larger diameter.

For Efficiency's Sake

By H. J. JOHNSON, Chairman of the Division of Office Labor Saving Devices

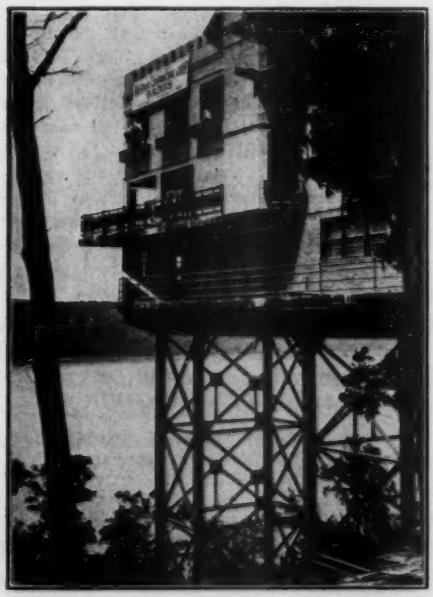
EFFICIENT office administration is receiving more attention today than ever before.

The reduction of costs and prevention of errors are the two important factors. This condition is probably more acute with public utility companies than in any other line of business because of the enormous volume of detail involved in comparison with the volume of business. The matter of rendering service bills to the thousands and hundreds of thousands of customers, handling of the accounts, and the analysis and distribution of revenue for statistical and rate making purposes is indeed a problem.

It is generally agreed that there is no better solution of this problem than the use of Office Labor Saving Devices. There will be an instructive exhibit of these under the auspices of the Manufacturers Section of the American Gas Association and all members are urged to avail themselves of the opportunity to inspect these. Trained and experienced representatives of the various manufacturers will be in attendance to demonstrate and explain these to your individual requirements.

When Pictures Tell the Story

THIS "HOUSE OF MYSTERY," so-called by its neighbors along Riverside Drive and 187th Street, New York City, is heated throughout by gas steam radiators. As *Gas Logic* says, there will never be any arguments in "the house on stilts" as to waste fuel and the proper degree of heat. Each member of the family may have his room heated just as he wants it by the simple device of applying a match to the radiator or turning it off. Cooking and water heating too, will, of course, be done entirely with gas. This new type of home was erected by Franklin D. Pagan and Harold D. Vernam, architects, for Cleveland Walcutt, a man of pioneer spirit. It occupies an irregularly shaped lot approximately 100 feet deep by nineteen wide on the sloping hillside which drops steeply to Riverside Drive. Construction work is by the Werner Contracting Company of New York, Wm. Passon, superintendent in charge.



THIS IS THE POTATO SEASON, and, although the picture below is a year old, it was felt that its publication in this issue might be both timely and suggestive. The float was brought out for Potato Day in Stockton, Calif., on October 18 last year as a cooperative effort between the Western States Gas Company and the Geo. D. Roper Corporation. The gas supply was carried in the tank shown on the truck at

a pressure of 100 lbs. Mounted directly on the tank was a regulator which reduced the pressure to a value suitable for the ranges. The truck was a working demonstration and baked potatoes during the parade and on the street all day. The potatoes were served hot out of the oven, with plenty of butter, and made quite a hit with the bystanders.

THE SMOKE ABATEMENT EXHIBIT at Wembley, England, is part of a general scheme devised and arranged by Mrs. Ethel M. Wood, who made the acquaintance of many Association members on her recent visit to this country. The photograph does not give a very good idea of the appeal of the smoke abatement scenes, Mrs. Wood says, because it is not possible to bring out the general atmosphere.

There are two rooms identical in decoration and treatment except for the fireplaces. One is furnished with an old-

fashioned coal fire grate, with the cinders and ashes lying in the grate, and everything in the room smudged by smoke and dirt. The other has an up-to-date gas heater, and, of course, everything is scrupulously clean and fresh. Through the windows you look out on to a drop scene which in one case is foggy and unattractive, while in the other the brilliant sunshine is pouring down on a spotless white street and lovely green trees.

"I tremble to think," Mrs. Wood generously hazards, "what the superior American imagination will make of this idea. However, so far as I, its author, am concerned, I make you a present of it."

SURPLUS MATERIALS

THE SAINT PAUL GAS LIGHT COMPANY is sending out a list of surplus material which it desires to dispose of. The material is in good condition and has been abandoned by them because of insufficient capacity for present requirements or a change in construction practice. It consists of blowers, gas compressors, current transformers, circuit breakers, rheostats, motors, exhaust fans, switchboard type meters, flood light projectors, backfiller bucket or scraper, hot gas valves, etc. A complete descriptive list can be obtained from Basil L. Nelson, superintendent of purchases, Saint Paul Gas Light Company, Saint Paul, Minn.

SPECIFICATIONS RECOGNIZED

IT IS VERY GRATIFYING to note that the Standard Specifications for Gas Heating Appliances of the American Gas Association are unreservedly accepted by the National Fire Protection Association. The report of its committee on Building Construction made to the Annual Convention of the N. F. P. A. in Chicago, May 12-14, at the instance of our representative, R. S. Doull, of the Consolidated Gas Co. of New York, contains the following paragraph:

"Article 25—Gas Heating Appliances: It is recommended that appliances be constructed and installed in accordance with the standard specifications adopted by the American Gas Association—unapproved heating devices are not permitted."

THE WALWORTH ALABAMA COMPANY has incorporated at Gadsden, Ala., with capital of $725,000, the announcement being made that the new company will carry out plans for enlarging the works of the National Pipe & Foundry Co., of Attalla, near Gadsden, recently purchased by the Walworth Co. of Boston. The officers are J. F. Thornburg, president; Wiley Alford, vice-president and general manager; Robert M. Henderson, vice-president and works manager; E. M. Grimsley, vice-president; J. E. Alderhold, Jr., secretary and treasurer. Valves as manufactured by the parent company will be made here as well as all kinds of soil, gas, oil, water, steam and air pipes and fittings, plumbing specialties, tools, etc.

New Casino Hall on the Steel Pier, Atlantic City, Where the Public Relations Symposium Is to Be Held and Where Members of the Technical and Manufacturers Sections Are to Meet.

The Gas Man's Challenge to the Chemical Engineer

By W. M. RUSSELL, Gas and Electric Improvement Co., Boston, Mass.

IT is confidently expected that the next decade will bring an increase in the requirements of gas supply out of all proportion to the existing capacity of plants and distribution stations. This expected great increase in the production of gas will call for tremendous investment in manufacturing plants and distribution systems, and an enormous increase in the consumption of the raw materials which enter into gas manufacture.

The gas engineer will be confronted with two problems—first, the process—second, the supply of raw material. At the present time there are two widely used processes. The distillation of coal, whether in retorts or in by-product coke ovens, supplies a considerable proportion of the total gas supply of this country, and this process produces, as a residual, valuable by-products in the form of coke and tar. By far the largest amount of gas, however, is made by the so-called "water gas" process, which utilizes coke or anthracite coal as a fuel wherewith to form blue gas from the action of steam upon it, which is then carburetted or enriched by the addition of oil.

Aside from the generation of gas, the business of gas manufacture offers many problems. The purification of gas is a chemical process and it has never received the attention from chemists and chemical engineers that other great industrial processes have received in this country. Very recently efforts have been made to eliminate the present cumbersome methods of removal of hydrogen sulphide in gas. These experiments have been, to a great degree, successful, and are highly encouraging, but the field is open, and further great improvements are possible.

Until very recently the thought of heating houses and business buildings with gas from the city mains has been considered rather fanciful, but at the present time, the situation is rapidly becoming very different, and several large companies are securing great success in heating by gas, utilizing appliances designed expressly for this purpose, operating at maximum efficiency. The question of rates has held back the development of heating business, but it is now believed that, with an assured market, a rate may be expected. This will mean a tremendous increase in the amount of gas required in this country so that the gas industry is prepared to assume the cost of research and to finance the construction of new plants to meet the changed conditions.

The gas industry as a whole has never received much attention from the chemical engineering profession. There are few mechanical problems which gas engineers have not satisfactorily met, and it is safe to say that any problem which is likely to arise the mechanical engineers can meet, but the chemistry of gas manufacture has not been developed. It is true that the gas industry has not welcomed chemical engineers. Many chemical engineers do not know that there are any opportunities for them in the gas business, and perhaps until recently there have been few opportunities. This situation is entirely changed. The gas industry is now in a position to challenge the chemical engineering profession to solve its problems.

I submit that the solution of these problems offers a great opportunity for chemical engineers. I do not believe there is any industry in this country which is more ready to receive attention from chemical engineers or which has more pressing problems for solution, or which can offer any greater rewards for inventors and developers of existing or new processes.

One of the greatest problems and opportunities lies in a process of gas manufacture which will utilize bituminous coal with either the admission of very little oil, or eventually no oil whatever. This process should take bituminous coal capable of coking and containing a rather high volatile content, and completely convert it into a mixture of coal and water gas, leaving as a residue only ash and clinker. It should be so designed as to distill all of the coal gas from the gas coal before the resulting coke is gasified by steam in the blue gas section of the process. The coal gas and blue gas should enter the same gas container and be distributed in mixed form. The machine should be so built as to utilize all of the waste heat derived from the process of blowing the coke fire prior to steaming it in making blue gas, and this waste heat should be utilized in some manner to distill the gas coal and form the coke. Equipment should be included to allow of the admission and carburetion of gas oil or, in the

Music Room of the Hotel Chalfonte Where Industrial Gas Men Will Gather.

future, of heavy grades of fuel oil. The process must be in a self-contained machine capable of operation by one man, and as near automatic in its control and operation as possible. With the present heating value standards, it will be necessary to arrange for the use of some oil, but if all of the coal gas can be distilled and saved, a very considerable proportion of the oil now required would be eliminated.

With the coming of lower B.t.u. standards which many gas engineers recognize as more or less imminent, the elimination of that part of the machine having to do with the fixation of oil can be expected and a very simple process would result.

Such a process capable of operating on the cheaper grades of gas coal now available and designed to handle successfully such heavy grades of oil as are not now considered suitable for gas making would secure the attention and favorable consideration of every gas engineer, and should go far toward solving the great problem of the future gas supply in the average community in the United States.

A Bituminous Paint Formula

A CHEMIST in the employ of the South Staffordshire Mond Gas Company, England, has evolved a formula for a new bituminous paint, according to the London *Gas Journal*. When tested, this paint exceeded the most sanguine expectations. It was found to be impervious to the effects of acids, gases, water, and extremes of heat and cold. The uses to which the new paint can be put, it is said, while still far from being fully explored, may be judged from some of the results that have been achieved. When applied to a gas plant at a temperature of 725° Fahr., it remained for several months as fresh as on the day of application. Another variety was found to dry in the remarkably short space of ten minutes.

The essential principle of the paint is bitumen of various kinds so combined as to make them extremely colloidal or adhesive. Practical test has proved that it "keys itself" into the metal and wood to which it is applied, and is capable of expanding and contracting with it, thus avoiding cracking.

Vincent Lopez's Orchestra Will Furnish the Musical Ingredient for Ardent Charlestonites Attending the Convention.

The best length for a talk to be given on a program with other speakers is about 2000 words, requiring 15 minutes. When there is only one speaker, it is permissible to extend the talk to 4000 or 5000 words, but never longer. A radio talk to "go over" well should be about 1000 words—every word carefully chosen.

A Traveling Home Service
With 6000 Square Miles to Cover

By MRS. EVA HAWKINS SHANKS, Public Service Company of Northern Illinois

Eva H. Shanks

THERE are still those who ask, "What is a Home Service Bureau?" It's a fair question, and a difficult one. Perhaps the best answer is to say that the purpose of Home Service is to add a personal touch to the relation between a large utility corporation and the Mrs. John Smiths who buy its service. It seems queer that the gas and electric company which brings so vital a service to the home, and draws so large a proportion of its income from the home, has only recently begun to develop a means of enjoying a closer acquaintance with its women customers. Home Service Departments exist because utility concerns have come to realize the wisdom of earning the good will of housewives.

Because we are aware of this need, our company established such a service nearly two years ago and put in charge of it a woman experienced in solving home problems of varied types as well as expert in cookery demonstration work.

Our first cooking school, a three-day affair, reported an attendance for the three days of 40, 55, and 75. The figures are significant in the increase from one day to the next because they are typical of what has happened at each school held since then. At a three-day school held a month ago, the daily attendance was 900, 1,100 and 1,500.

To build good will—that is all we ask of our Home Service Department. We do not ask it to sell gas stoves or electric ranges or to urge women to use more gas and electricity. We believe it does accomplish these results in an indirect way, by making women find kitchen work more attractive, by leading them to take pride and pleasure in the preparation of home-cooked food. We know that it is earning and holding the friendship of our women customers.

The problems of organizing our Home Service work were unusual. The majority of such departments, so far as we know, bring under one roof their research and office work and their cooking school demonstrations and lectures. Homes of customers are within easy reach; workers can follow up every stove installation and start the friendship in an informal and logical way.

In order to understand that our company faced conditions of a very different sort, you must know that we supply electricity or gas to 6,000 miles of territory in sixteen counties of Northeastern Illinois, including suburbs of Chicago, but not the city itself. There are 220 cities, towns, and villages in this territory, and some are located over 100 miles from the executive offices in Chicago.

Our most important work from the start has been to hold cooking schools. However, a very considerable volume of inquiries by mail has steadily developed, and each new school has added its list of correspondence asking help of all kinds.

There's a marked contrast between our schools and those held by a company operating in a single city. In the latter case, the lecture hall is often in the sales rooms for appliances, or at least is reached by passing through them. A model kitchen is fitted up permanently on a stage built for the purpose. Such a school has its regular schedule and

Picture of a One Night Stand from the Inside Looking Out.

The Cooking School at Blue Island Features a Bread Baking Contest.

customers drop in on whatever day is most convenient.

MUCH ADVANCE PREPARATION NEEDED

When one of our schools is scheduled, advertising and publicity must make certain that the women in the particular town know just when and just where the school is to be held, for in all but a few cases a public hall must be obtained for the meetings. Ranges must be installed and furniture borrowed to convert the stage into a workable model kitchen. The director of our Home Service travels from ten to a hundred miles to each school, accompanied by as many assistants as she will need, and takes with her a trunkful of kitchen utensils, souvenirs, programs, etc. For each school, a new kitchen installation must be supervised, markets must be visited and supplies purchased. The mornings are spent in research work, devising and testing new recipes and in preparing for the afternoon's program.

Each school usually lasts for three days, with demonstrations carefuly planned to cover typical recipes, including meats, breads, cakes, canning fruits and vegetables, salads, desserts and fancy frostings. For, as one visitor put it, "I can get up anything plain but am not much at fancy things and I want to learn how to fix things up pretty." Every effort is made to be practical, but this is not interpreted to exclude fancy dishes entirely. After all, what is more practical than to put on enough cookery frills to really please those for whom the cooking is done.

The director of our work has that ideal personal equipment for it which is not met by any means often. The three essentials rarely are found in the same personality; ability to cook before an audience, to talk without tiresome hesitations, and to have a smile and a glance for her audience at just the right moment.

At each session, about half a dozen of the published recipes are demonstrated, and exact directions for mixing and for heat control during baking are given out. The ladies all bring pencils and busily make notes on the margins of the neat little recipe books. They always show great eagerness for hints on new methods for saving time and money, for meal planning, budgeting and new recipes. And they always enjoy the sampling, too. Food cooked at a demonstration is served in small portions, and when crowds are large, extra supplies are baked before the school opens. Brides come to the schools, school girls come, old grandmothers come. Sometimes even a few men are found in the audience, especially if there's an evening session.

ADVERTISING A TYPICAL SCHOOL

About a week in advance of a school, neat printed invitations bearing the distinctive seal of the department are mailed to company customers in the town. These are followed by

advertisements in the local papers, occupying usually about four columns by 12-inch space. Window cards are sometimes used, and possibly one of the best mediums consists of attractive two-color posters placed on all trucks in the vicinity belonging to the company.

Inexpensive souvenirs in addition to the recipes are usually presented, and often valuable appliances are given in such a way as to increase attendance. Sometimes a bread-baking contest is a feature, with a stove the prize for the best loaf as judged by government standards.

Some free publicity is obtained, particularly when, as often is the case, the event is sponsored by some popular local women's club. The school held at Streator a month ago, at which the total attendance was 3,500 (in a town of 15,000 population), was very strongly supported by a local newspaper, the *Daily Independent Times*.

DOES IT ALL PAY?

No story of this kind which dodges the question of cost would be complete. Home Service costs money. We have no wish to deny it. Since the first of January this year, nineteen schools have been held; 13,040 women have attended. Counting all expenses—advertising, invitations, souvenirs, merchandise prizes, programs, traveling expense, theatre rental, etc., it has cost the company about 16 cents to entertain each of these guests. This does not include the cost of salaries and office overhead. On the other hand, the number of women mentioned is the actual school enrollment and does not include the very large additional count of women who have used Home Service in other ways.

We are certain that we have more than 13,040 new friends. Judged by school attendance, by requests received for further help and by the number of women who have heard of our schools and have asked for the same recipe books given to their friends, our work is effective and appreciated. We feel that more women are giving their best thought and attention to cookery as a result of our home service. It is therefore a source of pride to us.

HOME SERVICE NEWS

THE ANNUAL CONVENTION of the Home Economic Association was held in San Francisco, August 4th to 8th. Mrs. Anna J. Peterson, director of the Home Service Department of the Peoples Gas Light & Coke Company, Chicago, represented the Home Service Committee of the American Gas Association in the absence of Miss Swann, chairman of the Home Service Committee.

Mrs. Peterson, while en route to California on July 15th, spoke from Station KMX at Hollywood, California, and Station K G O at San Francisco.

Mrs. Peterson gave cookery talks over the air, and, because of her tremendous popularity from Station K Y M in Chicago, was received with enthusiasm all along her journey.

It is of special interest to us to have Mrs. Peterson bring before the convention delegates at San Francisco the work being done by home economics women in the utility field.

ON HER RECENT TRIP to Quebec, Miss Ada Bessie Swann, Director of the Home Economics Department, Public Service Electric and Gas Company, Newark, N. J., spent a day in Toronto, Ontario, as the guest of the Consumers' Gas Company. While in Toronto, Miss Swann visited Miss Eaton's Home Service Department and broadcast a cookery lesson from CKCL.

A very interesting incident was brought to the attention of the members of the Canadian Gas Association about the broadcasting of Miss Swann, when two members who were traveling to attend the convention, by way of the International Limited, told how they, with thirty other people, were receiving the program as it was being broadcast and they were traveling along over the country, and one after another of the people remarked, "Is it luncheon time now? This lady talking about fried chicken and New England marmalade is making me hungry."

Later on the travelers were introduced to Miss Swann as the lady who had given the program.

The International Limited is the only railway equipped with a radio receiving outfit.

ALICE BRADLEY was the honored guest of the Home Service Department of the Peoples Gas Light & Coke Company on her recent trip to the coast to attend the National Home Economics Convention.

Miss Bradley is principal of the Fanny Farmer School of Cookery in Boston and Cookery Editor of the Woman's Home Companion, as well as author of a number of cook books. She is one of the best known women in the United States in home economics work.

Affiliated Association Activities

Pacific Coast Gas Association

F. J. Schafer

THE Pacific Coast Gas Association held its annual convention for the year 1925 in Portland, Oregon, during the week of August 17th. Final registration lists showed that 285 members and guests gathered to celebrate the thirty-second anniversary of the Association and attended the sessions of the convention, which came to a conclusion with the Annual Banquet on Friday, August 21st.

The delegates were welcomed to the City of Portland by Mayor George L. Baker. The convention was especially notable for the variety of entertainment features provided which, in addition to the Annual Convention Ball, included dancing and entertainment on the good ship "Swan" and an entire day of sightseeing on the famous Mount Hood Loop Drive arranged as a mid-convention feature to relieve the strain of four successive sessions.

Retiring President E. L. Hall, in his address given at the opening business session on Monday afternoon, stressed the rapid increase in the use of gas as an industrial fuel where it is now employed for more than 6000 purposes and predicted an enormous increase in gas sales.

Mr. Hall presented an impressive analysis of the support given association work in other industries and made a strong appeal for greater support of association activities of all kinds now in progress in the interest of the gas industry. The keynote of his address was a feeling of tremendous optimism and confidence in the industry based upon the ever increasing recognition of gas as the best fuel for all purposes.

Officers of the P. C. G. A. elected for the coming year include F. J. Schafer, Los Angeles, president; W. S. Yard, San Francisco, vice-president; D. G. Martin, San Francisco, re-elected treasurer; and Clifford Johnstone, San Francisco, re-elected secretary. H. M. Crawford, San Francisco; J. E. Kelly, Stockton; D. J. Young, Tacoma; H. L. Masser, Los Angeles; G. P. Egleston, San Francisco; E. L. Hall, Portland; F. S. Wade, Los Angeles, and W. M. Thompson, Pasadena, will serve as directors of the association.

Special committee reports were read, looking toward the standardization of municipal requirements for installation of gas services and house piping, appliance construction, and closer affiliation with the American Gas Association. At the conclusion of the opening session, J. W. West, Jr., of the staff of the American Gas Association, read a message outlining the forward steps of country-wide significance now being taken by the national body and expressing the desire for the closest possible co-operation between the two associations on behalf of the industry as a whole.

Among the specially significant papers presented at the General Session, held on the second day of the convention, were "Premium Systems," by Donald E. Buyers, of the Portland Gas and Coke Company, and "The Future Fuel for Gas Making," by W. S. Yard, of the Pacific Gas and Electric Company. Mr. Buyers advocated remuneration of all artisans, mechanics and laborers according to their special proficiency and ability and gave the working details of the plan as applied to the Portland company during the year 1924. Mr. Yard pointed out the tendency toward higher prices and lower quality of oil during the past few years and stated that the large deposits of low-grade bituminous and semi-bituminous coals in Washington, Oregon and California would ultimately be utilized as the chief fuel for gas making on the Pacific coast on account of the less limited supply and more stable prices afforded by these fuels when compared with oil.

The Technical Section held parallel sessions with the Commercial and Accounting Sections at which reports on the production of oil, water, coal and reformed gas and the removal of foreign substances from manufactured gas were presented by the Bureaus of Manufacturing Processes and Purification.

Gas is being produced more cheaply by certain northwestern plants using coal than by California plants utilizing oil, it was stated. Unstable prices and the limit of the world's oil supply will eventually force all gas manufacturers to resort to other means for producing gas.

Studies of approved methods of cost accounting and labor records were presented and discussed at the meetings of the Accounting Section under the chairmanship of C. W. Platt. The purchase of equipment, its shortage and handling were other problems considered by the accountants.

Notable among the papers before the Commercial Section were the reports of the Bureaus of Advertising, Home Service, and Industrial Utilization prepared under the direction of F. U. Naylor, C. R. Miller and J. H. Gumz respectively.

The final day's session was given over entirely to the Public Relations Section, at which valuable reports on Educational, Co-

Some of Those Who Attended the Second Annual Gas Meter Lecture Course of the Southern Gas Assn.

operative, Employes Public Relations, and Customer Ownership work were read, and two inspiring addresses, "Selling Public Relations to the Public", by Norwood W. Brockett, and "Relations—Public or Human", by E. G. McCann, were delivered.

At the last business session appropriate resolutions were passed on the subject of a Municipal Gas Ordinance and Appliance Certification, and the convention unanimously adopted a resolution favoring closer affiliation with the American Gas Association, recommending membership of the Pacific coast companies to the end that the more effective co-operation desired by all might be accomplished.

At the annual banquet golf trophies were awarded, and medals were presented to W. H. Barton, J. E. Spelce, and C. R. Miller for the most meritorious papers. After the new officers were formally introduced, dancing took place in the Grand Ball Room of the Hotel Multnomah.

Southern Gas Association

The Second Annual Gas Meter Lecture Course, under the auspices of the Southern Gas Association, was held in the laboratory and shops of the Georgia Railway and Power Company, Atlanta, Georgia, August 4-5-6, 1925.

The Committee in charge, consisting of Chas. Leech, chairman, Macon Gas Co., Macon, Ga.; M. H. Pittman, Georgia Railway & Power Company, Atlanta, Georgia; M. L. Kane, Georgia Railway & Power Company, Atlanta, Georgia; W. G. Gribbel, John J. Griffin & Company, Philadelphia, Pa.; J. D. McIlhenny, Helme & McIlhenny, Philadelphia, Pa.; E. S. Dickey, Maryland Meter Company, Baltimore, Md.; A. McW. Wolfe, Maryland Meter Company, Baltimore, Md.; and W. P. Hutchinson, Sprague Meter Company, Bridgeport, Conn., arranged and carried out a successful program. There were 73 enrolled in the course.

The papers presented were as follows:

"The Gas Meter" and "Meter Setting and Handling" by W. A. Castor; and "Meter Shop Organization and Routing" by B. G. Waggner. Both Messrs. Castor and Waggner are of the United Gas Improvement Co., Philadelphia, Pa.

The instructors in the handling of the practical shop work were as follows: L. M. Stricklin, Georgia Railway & Power Company, Atlanta, Ga.; Ed. Pennell, Southern Public Utilities, Charlotte, N. C.; C. Hartogh, New Orleans Public Service, Inc., New Orleans, La.; John L. Arnold, and E. D. Wilder, Macon Gas Company, Macon, Ga.

Empire State Gas and Electric Association

The annual convention of this association to be held at the Lake Placid Club, N. Y., Thursday and Friday, October 1 and 2, promises to be a most interesting one. In addition to an address by President M. S. Sloan, the following addresses have been announced by Secretary C. H. B. Chapin: "The Importance of Holding Companies in the Financing and Supervision of Utility Companies", by George T. Bishop, chairman, United Gas and Electric Co.; "The New York State Commission on Housing and Regional Planning", by Hon. Sullivan W. Jones, State Architect; "Newspaper Advertising", by Thomas H. Moore, associate director, Bureau of Advertising, American Newspaper Publishers' Association; and "The Public Utilty Security Market", by Ray Morris, Investment Bankers Association. The chairmen of the sections will submit their reports at the convention.

The entertainment program provides tournaments for both the men and the ladies, automobile trips, card parties, teas, dance and a banquet.

The Committee on Arrangements consists of C. S. Ruffner, Schenectady, chairman; J. C. DeLong, Syracuse; and E. C. Scobell, Rochester.

THE ACCIDENT PREVENTION COMMITTEE report to be presented at the coming A. G. A. Convention contains a list of the various occupational hazards to be encountered in gas properties with specific precautions for prevention which will be a valuable aid in accident prevention activities.

GENERAL

CHAIRMEN OF GENERAL COMMITTEES ORGANIZED TO DATE

Accident Prevention—C. B. Scott, Chicago, Ill.
Amendments to Constitution—Wm. J. Clark, Yonkers, N. Y.
American Engineering Standards Committee, Representative on—A. H. Hall, New York, N. Y. —(Alternate Representative) W. J. Serrill, Philadelphia, Pa.
Award of Beal Medal—H. C. Abell, New York, N. Y.
Chamber of Commerce of U. S.—J. B. Klumpp, Philadelphia, Pa.
Co-operation with Educational Institutions—W. G. Gribbel, Philadelphia, Pa.
Customer Ownership—Charles A. Munroe, Chicago, Ill.
Education of Gas Company Employees—B. J. Mullaney, Chicago, Ill.
Entertainment—Wm. J. Clark, Yonkers, N. Y.
Finance—James Lawrence, New York, N. Y.
Gas Safety Code—W. R. Addicks, New York, N. Y.
Gas Standards & Service—J. A. Perry, Philadelphia, Pa.
General Specifications—A. H. Hall, New York, N. Y.
Geographic Sections—L. R. Dutton, Jenkintown, Pa.
Managing Committee of Appliance Testing Laboratory—R. W. Gallagher, Cleveland, Ohio.
National Fire Protection Association—R. S. Doull, New York, N. Y.
Nominating—R. B. Harper, Chicago, Ill.
Rate Fundamentals—H. M. Brundage, New York, N. Y.
Rate Structure—Ewald Haase, Milwaukee, Wis.
Representation on National Joint Committee of Public Utility Associations—D. D. Barnum, Boston, Mass.; H. L. Doherty, New York, N. Y.; A. P. Lathrop, New York, N. Y.; P. H. Gadsden, Philadelphia, Pa.; Charles A. Munroe, Chicago, Ill.; Wm. L. Ransom, New York, N. Y.; Alexander Forward, New York, N. Y.; H. C. Abell, New York, N. Y.; T. V. Purcell, Chicago, Ill.
Theft of Gas—H. B. Flowers, New Orleans, La.
Time and Place—A. P. Lathrop, New York, N. Y.

Beal Medal Awarded to R. L. Brown

THE Beal Medal, awarded for the best technical paper presented at the 1924 Convention of the American Gas Association, will be presented to Dr. Ralph L. Brown, of the United States Bureau of Mines, for his paper on "Gummy Deposits in Gas Meters,—Causes and Prevention", according to an announcement by the Committee. It is planned to present this medal along with the American Gas Association Meritorious Service Medal and McCarter Medals at the second day's General Sessions in Atlantic City on October 14.

The Committee was unanimous in awarding the medal to Mr. Brown, recognizing not only the amount of original research which was done in preparing the subject, but also the great value to the gas industry of the conclusions drawn therefrom.

Ralph L. Brown of the U. S. Bureau of Mines, Winner of the Beal Medal for 1924.

R. L. Brown was born in 1890 at Blair, Illinois, and graduated from the University of Missouri with the A.B. degree in 1913 and from the University of Chicago in 1917 with the Ph.D. degree in chemistry. Mr. Brown was an assistant instructor in the chemistry department of the University of Missouri during the year 1913-14. At the University of Chicago, he was Scholar, Assistant and Swift Fellow in the respective years 1914-15, 1915-16, 1916-17. During the war Mr. Brown was a lieutenant and served as a member of a group of chem-

ists and physicists selected by the National Research Council in the research section of the French Department of Armament, and worked on new offensive war gases. In the gas industry, Mr. Brown has been engaged in investigative work on by-products from coal distillation, largely with the Koppers Company. From 1919 to 1921, he was chemist-in-charge of their research laboratory. Since 1921, Mr. Brown has been with the Bureau of Mines and engaged on problems relating to coal distillation by-products and to carburetted water gas, dealing particularly with the unsaturated hydrocarbons. At present Mr. Brown is investigating the production of synthetic motor fuel from water gas and the composition of low temperature tar.

In acknowledging the announcement of the award, Mr. Brown wrote:

"In accepting this medal I am deeply conscious of a great measure of co-operation given me throughout the investigation on gummy deposits in meters by both my colleagues in the Bureau of Mines and the members of your staff, as well as by many companies and individuals in the gas industry. It is my expectation to be in Atlantic City on October 14 to receive the award."

The Beal Medal was originally presented by W. R. Beal in 1897 for the best paper read at the meetings of the American Gas Light Institute, and this award was renewed when the American Gas Institute was formed. When the American Gas Association was incorporated in 1919, T. R. Beal renewed the offer on behalf of the Beal family, specifying that the medal be awarded for the best technical paper presented at the annual convention.

HENRY L. DOHERTY & COMPANY have recently sold the Hattiesburg Traction Co., Hattiesburg, Miss., and the Lebanon Gas & Fuel Co., Lebanon, Pa., to the Mississippi Power Co., and the Meridian Light & Railway Co., Meridian, Miss., to the United Gas Improvement Co.

Carlton Geist

CARLTON GEIST, general manager of the Atlantic City Gas Company, and brother of Clarence Geist, president of that company, died on August 25 in the Atlantic City hospital following an acute illness of a month's duration. He was in his forty-seventh year.

A generally run-down condition of health, due to intensive activities in the management of the local gas company, together with the exploitation of several newly-patented devices, culminated a month ago in Mr. Geist's collapse.

The son of a middle-west farmer, Carlton Geist was born in La Porte, Ind., on Dec. 10, 1878.

His first association with public service was in Wilkes-Barre, Pa., where he resided several months, later going to South Bend, Ind. Upon being appointed general manager of the Lansing, Mich., Fuel and Gas Company, he moved with his family to the latter city.

Three years later, December, 1909, Mr. Geist moved to Atlantic City to become manager of the Atlantic City Gas Company. There were at that time two companies, the Consumers' Gas and the Atlantic City Gas and Water companies. Both were merged into the present company under the supervision of Mr. Geist.

NATIONAL FIRE PREVENTION WEEK

COMPANY MEMBERS of the American Gas Association are urged to co-operate with the National Fire Waste Council of the United States Chamber of Commerce during the period from October 4 to 10, which has been designated as National Fire Prevention Week. Following are a few of the ways in which gas companies can help in their communities:

1. Carry on a vigorous clean-up campaign during certain days of the week.
2. Hold fire drills in offices and plants.
3. Hold meetings of employes for fire prevention instruction.
4. Place fire prevention posters on bulletin boards and distribute literature on the subject to employes.

The A. G. A. has appointed J. G. Reese, chairman of the Insurance Committee, as its representative on the Council.

ACCOUNTING SECTION

H. C. DAVIDSON, Chairman — DEWITT CLINTON, Vice-Chairman

H. W. HARTMAN, Secretary

MANAGING COMMITTEE—1925

ARMSTRONG, J. J., Toronto, Ont., Canada. (Canadian)
BISCHOFF, W. H., Savannah, Ga.
BLANCHFIELD, JOHN I., Brooklyn, N. Y.
CARMICHAEL, E. T., Elkhart, Ind. (Indiana)
CASSELL, W. H., Baltimore, Md.
CHALMERS, W. D., Baton Rouge, La. (Southwestern)
CLINTON, DEWITT, Worcester, Mass. (N. E. Assn. Gas Engrs.)
CONOVER, J. L., Newark, N. J.
DOBBINS, W. A., Boston, Mass.
ERLACH, PETER, Hammond, Ind.
HAASE, EWALD, Milwaukee, Wis. (Wisconsin)
HALL, H. B., East Braintree, Mass. (Gas Sales)
HALL, ISAAC S., Boston, Mass.
HEINS, J. W., Philadelphia, Pa.
JAMES, F. M., Aurora, Ill. (Illinois)
KELLER, A. R., Syracuse, N. Y.
KURTZ, ADAM, Detroit, Mich.
LAWALL, H. J., Philadelphia, Pa.
LAWRENCE, JAMES, New York, N. Y.
MCKANA, G. E., Chicago, Ill.
MEYERS, W. J., New York, N. Y.
PACE, H. M., Charleston, S. C. (Southern)
PATTERSON, F. H., Rochester, N. Y.
PETTES, W. H., Newark, N. J. (New Jersey)
PLATT, C. W., Portland, Ore. (Pacific Coast)
PORTER, EDWARD, Philadelphia, Pa. (Pennsylvania)
POTTER, O. F., Newark, N. J.
PRESSANO, E. P., Yonkers, N. Y.
REESE, J. G., Baltimore, Md.
REYNOLDS, A. E., Springfield, Mo. (Missouri)
SAUER, W. A., Chicago, Ill.
SCOBELL, E. C., Rochester, N. Y. (Empire State)
SEARING, R. B., Sioux City, Iowa. (Iowa)
SHORT, A. F., Providence, R. I.
SPEAR, M. H., Flushing, L. I., N. Y.
TOSSELL, A. L., Chicago, Ill.
WASSER, O. E., Ithaca, N. Y.

CHAIRMEN OF SECTIONAL COMMITTEES ORGANIZED TO DATE

Analysis of Gas Company Statistics—H. J. LAWALL, Philadelphia, Pa.
Customers Accounting Committee—J. L. CONOVER, JR., Newark, N. J.
Insurance—J. G. REESE, Baltimore, Md.
Nominating—W. A. SAUER, Chicago, Ill.
Relations with Customers—W. A. DOBBINS, Boston, Mass.
State Representatives—A. L. TOSSELL, Chicago, Ill.
Undistributed Structural Costs—J. I. BLANCHFIELD, Brooklyn, N. Y.
Uniform Classification of Accounts—W. J. MEYERS, New York, N. Y.

Timekeeping Practices and Payroll Methods

By O. H. GROSSE, Milwaukee Gas Light Company

NO standard system or set of rules can be followed in timekeeping practices. Much depends on the character of the work, the location of the plants, and the types and number of men employed.

We have not installed some of the modern features, such as time punching and recording machines as used by some companies because a large percentage of our laboring class are of foreign extraction and are unable to read or write the English language. Therefore, it is necessary to have a system which does not require the worker to record his daily operations.

In the coal gas and carburetted water gas departments, the gang foremen, who have charge of small gangs of men, varying from eight to twenty men per gang, keep the record of time and the nature of work done by the workmen under their charge. The foremen are furnished with a time book, of pocket size, in which they record the men's numbers and names, the time they report for work, and the hours and description of work done during the day. At the close of the working day

Meter Dept., Milwaukee Gas Light Co.

No. 1153 Name John Dornbush Date 4/17/ 1925

KIND OF WORK	CHARGE TO ACCT. NO.	NO. OF OPERATIONS	UNIT	AMOUNT
INSTALLING METER CONNECTIONS	1305A	3	1	70
Chng. Metr. Headr. for Add. Meter	1305C	1	2	140
Leaks in Service Pipes	1305D	2	1	70
Repairing Services	1305E	1	1	70
Maint. [illegible] Appl.	1305R	1	1	70
INSPECT. METERS - NON-REGISTERG	1305E	1	1	70
HDLG. DOM. F. APPL. STRG. TO CON	1715A	2	2	140

Foreman. Checked: F. J. Burns Supt.

Complete Filled Out Sample Meter Department Time Card.

Works Timekeeper Taking Record from Gang Foremen's Time Books.

the gang foremen bring their time books to the time-keeper's office.

The number of hours and the description of work are transferred from the time books on to time sheets,which are made out in duplicate by the time-keeper. The account numbers are then entered in a column provided for this purpose on the sheets. The time sheets are then submitted to the respective general foremen for approval, and are then given to the works superintendent for final O. K. The original daily time sheets are forwarded to the payroll department at the main office by messenger service, and the duplicates are filed for record at the works office.

In the pipe-fitting department, as well as all other departments wherein the men are capable of keeping their own time, and where they do many different kinds of work, the time card system is used. At the end of each day's work the men report at the shop office to return their finished work orders; at that time they fill in the hours and descriptions of work done on time cards, which are furnished for this purpose. In order to aid the men in filling out the cards, a case of rubber stamps, with descriptions of work and account numbers, is kept in the shop office. They take the stamps covering the work done by them from the case, stamp them on the time cards, and then fill in the hours opposite the descriptions.

These cards are given to the shop time clerk who checks and balances the hours on the time cards with the work orders, which are handed to him with the time cards. He then enters the total number of hours that each man worked in a shop time book. (In order to keep time records of the men at the shop office, the shop time book is necessary, because the original time cards made out by the men are sent to the payroll department.) The cards are then sent to the superintendent's office for his approval. From there they are sent, by messenger, to the payroll department at the main office.

The method of time keeping in the street department is about the same as at the gas manufacturing plant. The gang foremen keep the time of the men working under them on time slips. At the end of the day the time slips are collected by the general foremen, who transfer the time from the slips to the standard time sheets. These are then given to the superintendent of street work, who approves and forwards them to the payroll department. Time recording in the street department differs from all other departments in that the time is charged to work orders instead of account numbers.

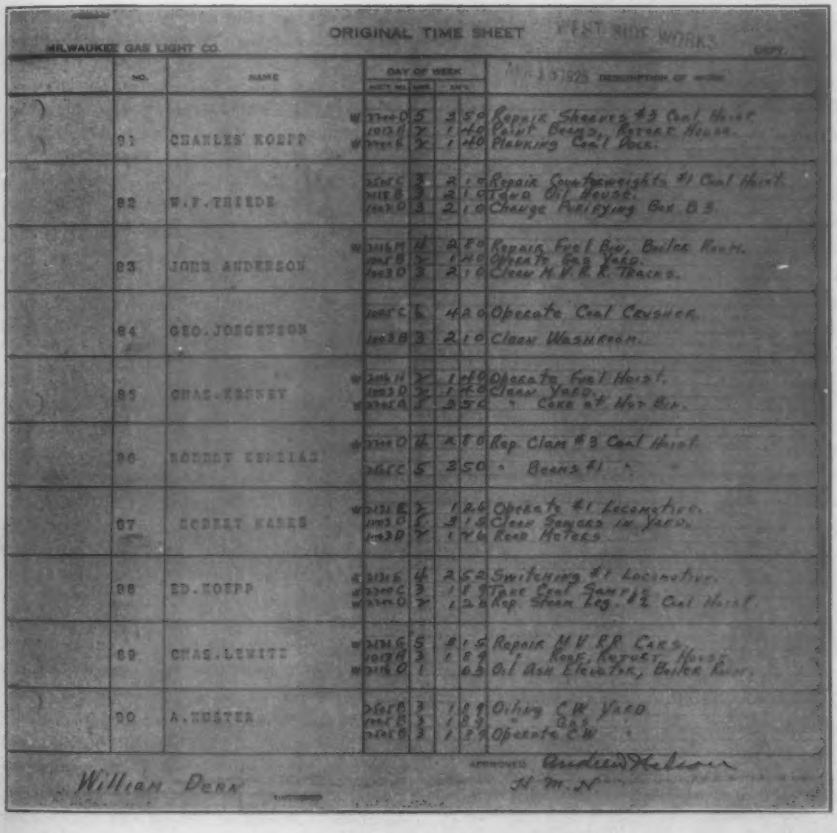
All time sheets and cards are sent daily to the payroll department and distributed among the payroll clerks according to the respective departments they have in charge. The first operation done by these clerks is to price the time sheets, that is, extend the amount opposite the

hours worked on the various account numbers. The amounts earned by the workers are posted from the time sheets to the men's individual accounts on the payroll. Each day's earnings on the payroll are totalled by departments. All account numbers are then checked for correction by the head payroll clerk.

The time sheets are then given to clerks who tabulate the charges by account numbers. The total charges to the account numbers are balanced with the total wages on the payroll for the respective departments for that day, and entered on a Summary of Payroll Distribution Record.

All Payroll and Summary of Payroll Distribution Record of Account sheets are ruled so as to take care of a full month's record. At the close of a half month each man's earnings are cross totaled and entered in a total column provided for this purpose on the payroll by tabulating clerks who are expert operators on the "Comptometer," a calculating machine, which is used extensively in our work.

The semi-monthly total of payroll is



MILWAUKEE GAS LIGHT CO. ORIGINAL TIME SHEET WEST SIDE WORKS DEPT.

NO.	NAME	DAY OF WEEK	ACCT. NO.	HRS.	RATE	DESCRIPTION OF WORK
91	CHARLES KOEPP	W	3	5	3 50	Repair Sheaves #3 Coal Hoist
		T	1003	7	1 40	Paint Booms, Retort House.
		F	3	5	1 40	Planking Coal Dock.
92	W.F. TRIEBE	S	3	2	1 40	Repair Counterweights #1 Coal Hoist.
		M	3	8	1 40	Oiling Oil House.
		T	3	2	1 40	Charge Purifying Box B3.
93	JOHN ANDERSON	W	4	2	1 50	Repair Fuel Buy, Boiler Room.
		T	7	1	1 40	Operate Gas Yard.
		T	3	2	1 40	Clean M.V.R.R. Tracks.
94	GEO. JORGENSON	T	5	4	2 40	Operate Coal Crusher.
		T	3	2	1 40	Clean Washroom.
95	CHAS. KENNEY	W	2	1	1 40	Operate Fuel Hoist.
		T	3	1	1 40	Clean Yard.
		F	3	3	1 50	" Coke at Hot Bin.
96	ROBERT KENDIAL	W	4	4	1 50	Rep. Clam #3 Coal Hoist
		T	5	3	1 50	" Beams #1 "
97	ROBERT KASER	W	2	1	2 40	Operate #1 Locomotive.
		T	5	3	1 40	Clean Sewers in Yard.
		T	7	1	1 40	Read Meters
98	ED. KOEPP	S	4	2	1 50	Switching #1 Locomotive.
		M	3	1	1 50	Tare Coal Cars #1 & 2 Coal Hoist.
		W	7	1	1 50	Rep. Steam Leg. #2 Coal Hoist.
99	CHAS. LEWITT	W	5	8	1 50	Repair M.V.R.R. Cars,
		T	3	1	1 50	Roof, Retort House.
		W	1		1 50	Oil Ash Elevator, Boiler Room.
90	A. HUSTER	T	3	1	1 50	Oiling C.W. Yard
		T	3	1	1 50	" Dock
		T	3	1	1 50	Operate C.W. "

William Penn APPROVED Gardiner Hubbard H. M. N.

Complete Filled Out Sample Time Sheet.

Payroll Clerks Tabulating Charges from Time Sheets and Footing the Accountant's Day Payroll with Comptometer Calculating Machines.

balanced with the summary of charges to accounts by departments. From checks on which the men's names were previously printed by the addressograph department, the check numbers are entered on the payroll opposite the total amounts earned by the men. The amounts are printed on the pay checks with a machine known as the Pay Check Writer. Then the men's names and amounts on the checks are called back with the payroll to correct any error in printing. From the pay checks the amounts are copied on to Wage Record Cards, on which a record of all wages paid to each individual employee is kept. These cards provide for a six years' record of wages. After entering the amounts on the cards, they are listed and footed on adding machines, and the total balanced with the payroll amount of each department. Our pay days are on the tenth and twenty-fifth of each month. This allows ten days' time for closing the payrolls, making of reports and preparing the pay checks.

The day before pay day the checks are dated and given to the paymaster for signature.

NOBLE L. CLAY, formerly manager of the Winston-Salem (N. C.) Gas Company, has left that company to take a new position at Palm Beach, Fla. He is succeeded by F. R. Warren.

The Accountant's Day

AN old gas man once told W. A. Doering of Boston that "darn good gas was made before the Accounting Department was heard of." In those days, grocery stores were run with cash drawers, while, today, up-to-date stores are equipped with recording cash registers.

Today, we are making better gas, and more economically than in the old days; and this is due partly to the fact that the Accounting Department is now in existence. The gas company today could not operate without an accounting department, any more than the grocery store could get along without the cash register.

A visit to the Accounting Section meetings held at Atlantic City in the past three years would open the eyes of those who heretofore have looked upon the accountant as one who sits at a high desk on a high stool, and is continually buried in figures and papers.

The papers under discussion in these three years have been interesting and instructive; and have created the most spirited discussion. The Committee on Customers' Relations, this year, are presenting a paper in three sections, each one of which should bring out discussion which will be beneficial to those who are in attendance.

There are a number of other papers of interest to not only the accountant, but the engineer also, and the executives. These papers should be of sufficient interest to continue the excellent attendance which the Accounting Section has enjoyed in the past three years.

PUBLICITY AND ADVERTISING SECTION
F. L. BLANCHARD, Chairman A. W. HAWKS, Jr., Vice-Chairman
CHARLES W. PERSON, Secretary

How the Gas Company Advertises Safety

ONE of the outstanding features of the April observance of the year-round fire-prevention campaign sponsored by the Grand Rapids, Michigan, Safety Council, and inaugurated by the Grand Rapids fire department, was the part played by the four local public utility companies. As a result, the campaign during that month is considered the most comprehensive and convincing of any period since the movement began.

Heartiest co-operation was offered by the utility companies. So that the message of fire prevention might be carried into every home, to every citizen 18 hours a day during the 30 days, each utility company was apportioned one week for its activities. After the campaign had progressed several days, it was decided that, by merging the last three weeks of the month for the combined efforts of three of the companies, greater results would be obtained, so a change was made.

The Michigan Bell Telephone company was assigned the first week, and opened the campaign by using placards on its trucks and a "slip-in" message that accompanied the monthly statements to all its subscribers.

The second, third and fourth weeks were assigned to the Grand Rapids Gas Light Company, the Consumers Power Company and the Grand Rapids Railway Company, respectively in the order named. Oscar W. Kastens, of the Consumers Power Company, was appointed general chairman of the utilities committee, and after several meetings it was decided to make the last three weeks more intensive and convincing by concerted action. The combined publicity forces of the three companies aimed their biggest guns at the public mind and began a barrage of slogans, "slip-ins," banners and placards that everywhere were working and read throughout the city.

During the second week, the Consumers Company enclosed a fire prevention message with every statement issued, as did the gas company. The Consumers Company also devoted one of its largest show windows to a very attractive display that attracted much attention to the campaign. The Grand Rapids Railway Company mailed 15,000 copies of its *Trolley Topics,* containing a forceful fire prevention sermonette, direct to citizens, schools, libraries and other interested parties in the campaign, and placed 34,000 copies in their cars as "pick-ups" for riders.

Simultaneously, on the first day of their allotted period, these three companies started their placard and banner campaign. The railway company's cars carried banners that read: "Prevent Fire! Make Grand Rapids a Safer City in Which to Live." This same message appeared on the trucks of the Con-

From National Safety News.

sumers and gas companies. The second week the banner slogan read: "Clean Your Attic! Make Grand Rapids a Safe Place in Which to Live." Again, these went on all street cars and all trucks. The third week this message worked day and night: "Clean Your Cellar! Make Grand Rapids a Safer Place to Live," and the last week, summing up the fourth important point in the general campaign, these placards shouted: "Teach Your Children to Prevent Fire! Make Grand Rapids a Safer City."

As a climax for the last Saturday in the month, the railway company, the power and gas companies had prepared large tag "tie-ons" carrying the fire prevention message to automobile owners and warning against fire hazards in garages. These were attached to 5,000 autos in the downtown district, the work being done by the Boy Scouts, who generously donated their time and effort to furthering the campaign. The tags were wired to the radiator caps of the autos, thus assuring against littering of streets, avoiding violation of local ordinances and securing the message until the auto owner returned and read it. Many supposed they were impounding tags, read them hurriedly, then smiled and allowed them to remain that others might step from the curb and get the message.

Strong Stuff in Small Doses

ONE of the interesting publicity features of The Brooklyn Union Gas Company is the "Gas News", which is issued every once in a while. The issue below, Volume 1, No. 13, is headed "Co-operation is Success." It is signed by the president of the company, James H. Jourdan. The text of the "Gas News" in this edition will speak for itself.

The first copy was issued on January 1st, 1925. In this issue is told the story of the seventy-five years of gas service in Brooklyn and the fact that the supply has never been interrupted for three quarters of the century.

Since then various phases of the business have been published. One edition was devoted to the "Schafer Prone Pressure Method of Resuscitation." Another spoke of the Citizens Military Training Camp. Other editions have been filled with stories concerning safety in the industry. On May 30th, Memorial Day, Lincoln's Gettysburg Address was published in full.

The publication is printed from time to time in different colors as to stock and type, making it attractive to the readers.

About three hundred copies of this publication are distributed at every issue. Bulletin boards have been placed in the various works, branches and offices of the company, and a copy is posted on these.

In each of the branches, copies are posted so that they may be easily read by the public coming to the gas office to transact business.

The Brooklyn Union Gas Company
The Flatbush Gas Company
The Newtown Gas Company

Gas News

The Jamaica Gas Light Company
The Woodhaven Gas Light Company
Richmond Hill & Queens County Gas Light Company

Vol. I AUGUST 3, 1925 No. 13

CO-OPERATION IS SUCCESS

These are the days of our larger growth.

Let us, each in his place, strive to develop and retain the confidence of our customers in us, and secure the satisfaction of a service well performed.

We all share in the credit of such an achievement. Our affairs prosper to the degree that we have satisfied the public.

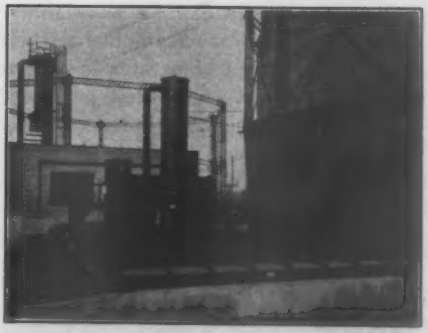
In this great industry all of us can be proud in the dignity of labor well performed. We can make our effort even more effective by increasing initiative and teamwork. Such a course assures self advancement, increases the usefulness of this Company and assures satisfactory public service.

James H. Jourdan,
President

Changing the Purifier System Over-night

THE Lincoln Gas & Electric Light Company, Lincoln, Nebraska, has expended a large amount of money for new equipment during a reconstruction program begun in the year 1923 and ended in 1925. Realizing the necessity of keeping ahead of a constantly increasing demand, and so that service of the highest order might be practically guaranteed, the boiler room, electric generating station, gas works and all apparatus contained therein, were literally razed to the ground and new buildings and new equipment now takes the place of the old.

It would make a very interesting story to describe some of the ways and means resorted to during such a period of change-over from old buildings and apparatus to the new, still maintaining continuous service satisfactory to customers.



The New Purifier Box in Service.

In making changes from old to new gas plant equipment in the production department of the Lincoln Gas & Electric Light Company, the most ticklish piece of work undertaken was the cut-over from the old cast iron purifying boxes,

which had been in service over forty years, to new steel and concrete boxes of the modern type.

The storage holder was installed about eighteen years ago with no valves at either inlet or outlet, and elaborate preparations had to be made to open the 20″ inlet pipe, insert a tee and connect the holder with a new station gas meter and the outlet of the new purifiers.

All of the work had to be done at a point of minimum load, or between eight o'clock p.m. and midnight. The time to stop making gas had to be calculated to a nicety, and the last run was made at about 3 p.m. This calculation had to be almost exact, as raw gas had to be pumped from the relief holder, through the old piping and purifiers into the storage holder, and after the dinner-hour load, when the amount of purified gas in the storage holder about equalled the capacity of the relief holder, the process was reversed and the storage holder emptied into the relief holder, which then supplied the city during the time the cut-over was being made.

It was estimated that the work would take three hours if everything worked out as planned, but preparation had been so complete and the job so well managed, that in just one hour and thirty-five minutes the new connection was complete and gas was being passed through the new exhauster, purifiers and meter into the storage holder.

DEVELOPMENT of the Doherty Gas-Oil Burner has reached a nearly perfect stage, according to an announcement by Henry Loebell, vice-president and manager of the Combustion Utilities Corporation.

It is planned to install a few hundred of these house-heating plants in 1925, possibly as many as 2,000 in 1926, and 5,000 in 1927, with the amount increasing each year thereafter for an indefinite time. It is estimated that each one of these burners, when installed in a home, is equivalent to taking on four or five new ordinary gas and electric customers by a local public utility company.

Motor Checking for a Thousand Cars

AT the automobile maintenance building of the Public Service Production Company in Irvington, where nearly 1,000 automobiles used by the various operating companies of the Public Service Electric & Gas Company throughout New Jersey are sent for major repairs, the auto maintenance department has installed a motor check.

Everything Tested Automatically Except the Rattles and Squeaks.

By means of this new device, an automobile can be given a complete examination in an hour. The car is run up on a steel stand and is connected with various checking units to record every phase of the engine's functioning. Results of the tests are indicated on a series of dials.

The horsepower delivered at the rear wheels is determined by readings of the dials showing the rotary force of the mechanism, the revolutions per minute and the speed per mile. The gasoline consumption under varying load conditions is measured by a flow meter attached to the gasoline line. The effect leakage has on the car's ability to develop power is determined by the slippage of the working charge past the pistons in cubic inches per minute at any speed or load. Back pressure in the exhaust is located by a back pressure gauge. A meter which analyzes gases determines whether or not the gas mixture is correct. The compression in each cylinder and the consumption of oil due to leakage past the piston rings are measured. By distilling a sample of the crank case fluid, the oil dilution in relation to mileage is determined.

Let's Get After That Summer Load

By F. J. SCHAFER, Assistant General Manager, Southern California Gas Company

DOWN in Egypt, about four thousand years ago, we are told of an experience covering two periods of time—seven years each—one of plenty and the other of want. So great is the impression on the human mind of the remarkable treatment of this phenomena, that, even in this day, we are filled with amazement and wonder at a world-upsetting catastrophe, held at bay by the brilliant execution of the master mind of Joseph, in coping with a critical situation confronting the country, the people, and the king of his time.

How many gas companies are in a similar or worse condition than was Egypt—possibly not so enduring, but more frequently because of yearly repetition—is difficult to estimate, but there must be quite a few, and this not so much because of two constantly recurring periods, each of approximately six months—one of abundance, the other of privation—but because there is no Joseph to consistently interpret the nightmare of inadequate summer returns. Most gas companies are not in a position to apply the identical remedy used in Pharaoh's time, that of gathering in the fat of one

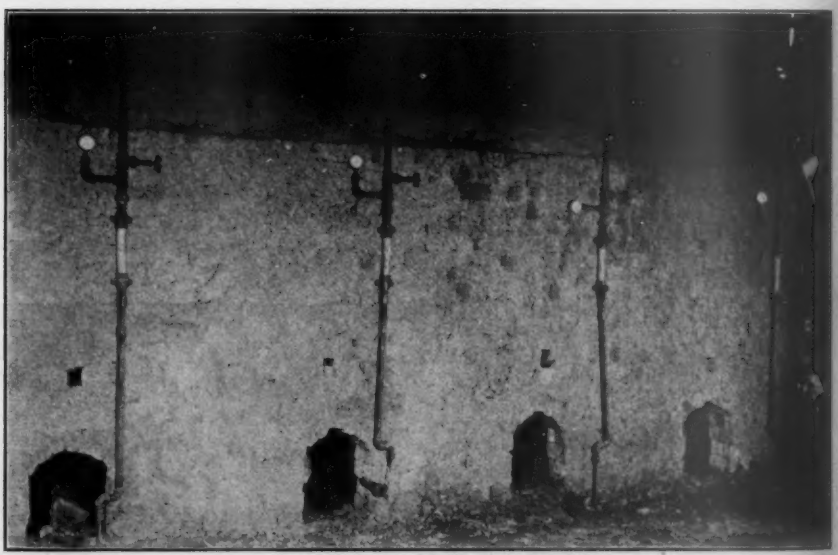
Fuel Gas Burners in a Portland Cement Plant Give a Summer Load of Eight and a Half Million Cubic Feet Daily.

season to support the lean of the other, but they can probably go Joseph one better, by making the lean less emaciated, to the point where at least it can help itself.

The main difficulty with the gas period of plenty is that it seldom has an overplus which can be made to satisfactorily spread over the period of want, and, therefore, it becomes expedient to improve on the old-fashioned method by attacking the famine-stricken period through an intensive and progressive system of internal restorative rather than by an unorderly, unscientific, and costly palliative of external application. Local conditions, which may be different, must of necessity govern the interpretation to a considerable extent in individual instances, but it can always be taken as a foregone conclusion in all gas companies that apparatus and equipment is going idle during times of low gas send-out which could be put to use in manufacturing and delivering at a low price from which the gas company and the gas customer could both derive equal benefits.

The first essential in any such program is a comprehensive and unbiased survey of gas costs, and to this end all items of expense not directly applicable to surplus gas manufacture should be eliminated. Having determined with absolute certainty just how much actual money goes into the manufacture and delivery of surplus gas over and above the ordinary summer requirements, the next step is in the direction of the disposal of this gas at a price that will justify its sale by the company as well as its purchase by the customer. This requires the most painstaking investigation of the industrial field, going into all the minute details of comparative fuel figures, and should be made only under the supervision of an experienced combustion engineer.

From the data collected a "business availability column" can easily be set up from which it should be a small task to arrive at a rate—not what the traffic will



Gas-Fired Brick Kiln. Thirty Thousand Brick Are Fired Daily Throughout the Summer Months in this Kiln.

bear—but a rate that will bring the company a return, not based on its investments, overheads, etc., but on the potential possibilities of its wholly or partly idle equipment. Keeping in mind that any gas sales at a price above the cost of labor and material is in effect and fact so much profit which will help to put a little fat over the protruding rib structure of the summer load.

In a natural gas situation, such as ours, which is always more flexible than a condition of manufactured gas supply, we have worked out a system of priorities and rates that practically assures us of a continuous load factor for the entire year, and while such results can probably never be expected for a manufactured gas company, there nevertheless are many small industries which, under favorable conditions, can and will use manufactured gas exclusively in the manufacture of their product, and there are many large industries which could be induced to use this service in part.

Manifestly, this business cannot be had for the asking. The industries are too busy with problems of their own to go very far out of their way to solve other people's and unless a gas company is prepared to go all the way to bed rock with its investigations and determinations, it is more than likely that failure will result. It is equally true, so far as I know, that no gas company has ever entered the industrial field with a rock-ribbed determination to arrive at a common sense level, where seller and buyer could share the advantages, without improving not only its summer earnings, but frequently adding to those of the winter.

What particular industries lend or adapt themselves most readily to gas fuel, either in part or as a whole, depends also to some extent, if not altogether, on local conditions. An industry

Gas-Fired Steam Boiler Supplies Hot Water During Summer Months to the Union Theological Seminary of New York.

in one location may be able to use it to advantage where it may be prohibitive in another, and it is right here where the modern Joseph gets in his best licks.

If the dream is incomplete, or if the interpretation thereof is not sure, the lean period will receive no benefits and may possibly be further emaciated.

I have been frequently asked what industries are most easily adjusted for a substitution of gas for other fuels, both from the standpoint of trouble and expense of burner and furnace equipment, as well as from the standpoint of fuel economy, but no intelligent answer can be given except in the light of local conditions. The larger class of industries present the greatest problems, but there should be comparatively little difficulty in obtaining candy, soldering, and galvanizing furnaces, as well as bakeries, creameries, and the like, and these, once obtained for a starter, will help pave the way for the more ambitious undertaking.

"Food Products" Is Out

THE fourth volume of the Industrial Gas Series, entitled "Food Products", is now ready for distribution. The price will be $1.50 to members and $3.00 to non-members of the Association.

Each of the major food industries has been separately treated in order that information

Gas-Fired Smoke House Installation, One of the Illustrations.

relating to any specific application of gas might be conveniently at hand. The chapter titles are:

Chapter I—Gas and the Food Products Industry.
Chapter II—Hogs and Their Treatment.
Chapter III—Smoking of Meats.
Chapter IV—Sausage and Meat Loaves.
Chapter V—Coffee, Cocoa, Peanut and Other Roasting Processes.
Chapter VI—Dried Food Products.
Chapter VII—Other Gas Applications in the Food Industry.

The chapter headings, however, do not give an adequate picture of the really comprehensive contents of this handy reference work. Each chapter is divided into a number of sections dealing with a specific heating operation in which gas can be employed with the greatest success. In the last chapter, for example, there is considered the application of gas to fruit ripening, sugar manufacture, candy making, syrup boiling, pasteurization, canning and a general section on the gas-fired steam boiler.

This may serve to give a little idea of the way in which the work has been handled. It is felt that this volume will be a most valuable addition to the library of every industrial gas engineer, and, as the editions are limited, everyone is strongly urged to place their orders promptly.

PERSONAL MENTION

A. B. MACBETH, executive vice-president of the Southern California Gas Company, reported to the Santa Barbara Chamber of Commerce on September 1 that the gas and electric companies of Los Angeles County had contributed a total of $8,000 to the emergency relief fund designed to relieve the distress of the stricken city. The gas and electric companies were the second trade group to report their returns, the campaign for which was conducted under the personal direction of Mr. Macbeth. There are twenty-five other groups still to report from whom it is hoped to collect a total of at least $1,100,000.

ROY G. MUNROE, assistant commercial manager of the Public Service Company of Colorado, on August 22 celebrated his twenty-fifth year as an employe of that company. He was first employed to read meters, and four years later was promoted as assistant representative under Clare N. Stannard. Then came the position of service supervisor, next industrial fuel engineer and in 1922 he was elevated to his present position. He has the record of selling the first storage heater and the first gas househeating plant in Denver.

THE LACLEDE GAS LIGHT COMPANY of St. Louis has created a position of safety engineer and employed John J. Barada of St. Louis as its first occupant. Mr. Barada, a former gas man who for several years has been doing safety work, resigned as safety engineer for the Scullin Steel Company of St. Louis to accept the new place. He will be attached to the staff of C. Howard Stewart, assistant treasurer, in charge of claims, insurance and accident prevention. Mr. Barada is a member of the American Society of Safety Engineers, and the Society of American Military Engineers.

CORRECTION

OWING TO AN OMITTED PARAGRAPH in Robert B. Mahn's article in the September issue of the MONTHLY, "The Cinderella of the Distribution System", a false impression was created that in New York a single meter system had been adopted to take care of the entire load in an apartment house. What Mr. Mahn actually had reference to was the substitution of one meter in place of two in a certain type of high class apartment where the practice formerly was to place the basement laundry and the apartment to which it belonged on separate meters.

COMMERCIAL SECTION

J. P. HANLAN, Chairman R. L. BURDICK, Secretary J. B. MYERS, Vice-Chairman

MANAGING COMMITTEE—1925

ADAMS, W. A., Chicago, Ill.
AMMERMAN, RAY, Jenkintown, Pa.
ATWOOD, B. H., Wilmington, Del.
BAILEY, E. P., Jr., Cleveland, Ohio.
BARTLETT, C. E., Philadelphia, Pa.
BATES, S. F., Macon, Ga.
BURKE, E. J., Indianapolis, Ind. (Indiana)
BURNS, J. J., St. Louis, Mo.
CANNIFF, R. J., Poughkeepsie, N. Y.
CAPEN, FRANK, Boston, Mass. (Gas Sales of N. E.)
CLARK, J. C. D., Boston, Mass.
CLAY, NOBLE L., Winston-Salem, N. C.
COONEY, E. J., Lowell, Mass.
CORL, WILEY F., St Louis, Mo. (Missouri)
CRANKSHAW, J. WARD, Allentown, Pa. (Pennsylvania)
DAVIES, J. E., Chicago, Ill.
GASTON, LUTHER, Birmingham, Ala. (Southern)
GOULD, WM., Boston, Mass.
GRADY, STANLEY, Philadelphia, Pa.
HAYES, D. W., Detroit, Mich. (Michigan)
HUMM, A. W., New York, N. Y.
JOHNSON, W. B., Toronto, Ont., Canada. (Canadian)
JONES, JACOB B., Bridgeton, N. J., (New Jersey)
KARSHNER, G. M., New York, N. Y.
KENNEDY, THOS. F., New York, N. Y.
KEYS, HARVEY A., Pittsburgh, Pa.
KLOPF, G. C., Chicago, Ill. (Illinois)
LITTLE, STANLEY E., Lorain, Ohio.
LUTHER, C. A., Chicago, Ill.
MARTIN, E. H., Des Moines, Iowa. (Iowa)
MORRIS, W. A., Brooklyn, N. Y.
NORTH, M. F., Fort Wayne, Ind.
PHENICIE, C. R., Green Bay, Wis. (Wisconsin)
POST, A. P., Philadelphia, Pa.
REAGAN, W. J., Utica, N. Y. (Empire State)
SMITH, DORSEY R., Baltimore, Md.
STOTZ, LOUIS, Philadelphia, Pa.
SWANN, ADA BESSIE, Newark, N. J.
TUDBURY, JOHN L., Salem, Mass. (N. E. Gas Engrs.)
VALENTINE, H. D., Chicago, Ill.
WARDELL, C. W., Philadelphia, Pa.
WHITWELL, G. E., Tacoma, Wash. (Pacific Coast)
WISER, P. B., Brooklyn, N. Y.

CHAIRMEN OF SECTIONAL COMMITTEES ORGANIZED TO DATE

Architects and Builders—W. A. ADAMS, Chicago, Ill.
Gas Refrigeration—H. D. VALENTINE, Chicago, Ill.
Home Service—MISS ADA BESSIE SWANN, Newark, N.J.
Sales Stimulation—R. J. CANNIFF, Poughkeepsie, N. Y.

Making House Heating Visible

By L. E. LINDSAY, Peoples Gas Stores, Chicago, Ill.

A DISPLAY window, in order to fulfill its mission to the fullest extent, should do more than just display its merchandise. It should sell that merchandise. Indeed, in order to be successful, it must do this. If planned and executed successfully, it should go farther and sell an idea as well, an idea intimately connected with the appliance on display, and one which will work on the mind of the prospect when the display is no longer before him. This holds true in many lines of business and especially so in the gas industry.

Many times observers of display windows are definite or nearly definite prospective customers who are merely not quite ready to buy. If a display window will sell an idea as well as the subject of that idea, the product or appliance, this thought will work toward bringing about a sale many days, or weeks, or even months, after the display in question has been shown. By selling an idea as well as an appliance, a good display can thus be made to work in the minds of prospects for a considerable time after the initial exhibition.

This is the thought put into the display windows designed for the chain of Peoples Gas Stores throughout the city of Chicago. How this double function is built into a successful display is described herewith.

A representative instance is a window designed to exhibit gas-fired house-heat-

A Good Display That Sells the Idea of Convenience and Efficiency as Well as the Appliance Which Is Featured.

ing boilers. The purpose of the exhibit was to sell a dominant and striking idea as well as the gas-fired heater itself. This idea was the convenience and efficiency of automatically controlled gas as a fuel for house heating, on the theory that, though an observer might not be moved by the display to an immediate investigation and purchase, the planting in his mind of the convenience and efficiency of automatic gas heating might later move him to make an inquiry which would in all probability lead to a sale. This was done by having a gas-fired boiler coupled with a large thermometer and a moving dial showing how the heat is regulated automatically in accordance with the rise and fall of temperature shown by the thermometer.

To the right of this display is an automatically controlled gas-fired boiler harnessed to a heat regulator by chain and pulleys suspended from dummy heating pipes in place on the boiler. To the left of the boiler is a small board on which are mounted the control instruments. Further to the left is a large display frame, three feet wide and four feet high, on which is mounted a slide giving a realistic picture of the flames in the boiler which come on and off gradually according to the seasons and the temperature, the seasons being indicated by a revolving disc showing "spring", "summer", "fall", and "winter", situated at the top of the frame and by a large thermometer in which the red "mercury" rises and falls according to the season indicated by the disc. In addition a dial hand swings from the thermometer to the gas flame and back again, focusing attention on the automatic connection between heat and temperature, and selling the IDEA OF CONVENIENCE AND EFFICIENCY.

In front of the instrument board just to the left of the boiler are two cards attached to the motor and thermometer of the control board by red ribbons. The card connected to the regulating motor reads, "This is the janitor (motor) placed on the wall in your basement and operates the furnace." The card connected to the thermostat reads, "This is the mind

(thermostat) placed on the living room wall and directs the movement of the janitor (motor) in the basement."

At the top of this board is a small light that heats the thermostat, exciting it to action and causing the motor to function as it actually does under house heating conditions. By making a ½ revolution it operates the gas valve of the combustion chamber in the boiler, automatically turning on the heat and again driving home the IDEA of CONVENIENCE and EFFICIENCY as well as the appliance itself.

This is further amplified by the large display frame at the left as already explained. This is headed prominently by the words, "When you heat with gas, the thermometer runs your furnace." The dial hand quickly falls toward the thermometer just before the "mercury" begins its descent, pointing out that "When the outside temperature falls, the house temperature rises automatically." At the bottom of the card are the words, "Illustrating the influence of the outside weather temperature over the operation of your house heating furnace through a cycle of four seasons. Gas is the modern fuel for your heating needs." At the extreme left is another card reading, "When you heat with gas, you fire your furnace just twice each year. In the fall you turn on the gas and light the pilot, in the spring you turn off the gas. It is automatically controlled and runs itself. Let us tell you about it."

This is graphically shown by the moving hand, which constantly points first to the "season" and "temperature" and then to the corresponding "flame" shown in the slide at the right of the frame. This hand has a very simple mechanism which operates the revolving disc carrying the "seasons", the attention-getting hand, the liquid in the thermometer and the fire slide, all of these being driven by a small motor. This has run quietly from 8 in the morning to 11 at night continuously, with no attention other than oiling and cleaning once or twice each week, for four months, and it has been on three different locations.

With the exercise of a little ingenuity, displays of this type can be had at small cost, this one having been built in my studio and mainly constructed from small parts that have already been used several times in previous mechanical display features. In this way the automatic connection between the seasons, temperature, and the gas-fired boiler is simply and graphically presented in an attractive, attention-arresting unit which not only explains and sells its appliance, but, in addition, sells an idea. And ideas are essentially the prime requisite for successful salesmanship.

THE LETTER BOX

HOUSEHEATING "ADS" AGAIN

To the Editor of the A. G. A. MONTHLY:

I have just read the August A. G. A. MONTHLY; a very interesting and a very interestingly assembled issue. I notice that the MONTHLY did me the honor of reproducing two of my Consolidated Gas Company advertisements. The article accompanying the illustrations opens with this question: "How shall house heating be advertised? Can it be effectively done by the three principal accepted mediums, newspapers, posters and window displays?"

The newspapers are first mentioned very properly. Through that medium you obtain your largest audience. It is not to be assumed that every reader of a newspaper is interested in the subject, particularly in New York, where hundreds of thousands of apartments shelter humanity. Apartment dwellers are wont to enquire about the adequate provisions for heating before they sign their leases. Many others own and occupy private dwellings. These must be assumed to have little or no knowledge of gas heating and its manifold advantages. The properly constructed newspaper advertisement is intended to interest that

class of reader and awaken a desire in the householder's mind for further additional and technical information.

At this point the salesman or saleswoman is introduced into the picture. The newspaper advertisement has done all that it could be expected to do. It has told tens of thousands of gas heating. The "poster" and the "window display" is simply a "tie up" or a supplementary method of keeping the public's interest alive.

Another matter for consideration is the *location* of the show window and the placing

Doing for the Reading Public What Mr. Lindsay's Display Does for the Passerby.

of the posters. How many persons pass the window or windows? What proportion of the number passing the window or windows see the goods displayed? How many of those who stop to look at the "display" are sufficiently interested (or have reason to be interested) to enter the salesroom? Posters are but reminders, intended to keep the subject or object advertised in the mind of those who chance to see the "poster." The "pulling power" there is a questionable quantity, but the "poster" treating of a subject that has been dealt with in the daily newspaper is apt to renew in the mind of the cursory observer of the "poster's" message the reader's impression received when he (or she) saw the newspaper advertisement. I was not invited to reply to the MONTHLY'S questions, but there was something "inviting" about the article on page 499, so why not express a few thoughts in writing when one is on a part vacation?

In closing, I would say that much depends on the way any advertisement is "put up." As you know, a mighty good newspaper "story" may be spoiled in the telling. Experience teaches how to interest and hold a reader. Would that more who have lived their lives by the "foot rule" understood what the *public* wants and gave it to them in their way.

Yours very sincerely,

ROBERT E. LIVINGSTON.

NEW HOME SERVICE ENTRIES

FOUR MORE GAS COMPANIES established Home Service Departments during August. They are:

Citizens Gas and Fuel Co., Terre Haute, Ind., Miss B. L. Barnes;

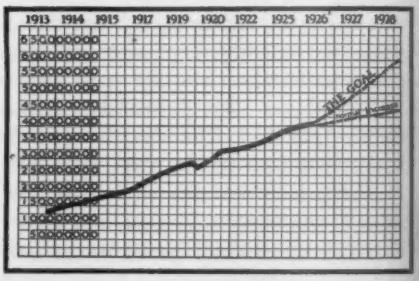
South Carolina Gas & Electric Co., 187 West Main Street, Spartanburg, S. C., Miss Catherine A. Mulligan;

Empire Gas & Electric Co., Auburn, N. Y., Miss Gladys I. Cook, Com'l Mgr., Wm. F. Moses;

Milwaukee Gas Light Co., 182 Wisconsin Street, Milwaukee, Wis., Mrs. Lambert in charge.

Mr. Ewald Haase, vice-president and secretary-treasurer of the Milwaukee company, is giving this new department his support, and we are most glad to welcome the Milwaukee Gas Light Company to our ranks in this worthwhile service work.

Are You Doing Your Share?



Heat Transfer in Tubular Gas Condensers

By Prof. WILBERT J. HUFF, Johns Hopkins University, Baltimore, Md., Chairman of Sub-Committee on the Theory of Heat Exchange and Condensation

(Concluded from September issue)

THE CONVECTION OF HEAT

THE transfer of heat by convection is the most important mode of transfer functioning within the gas condenser. In general, liquids, gases, and vapor have relatively low radiating capacities and low thermal conductivity, whereas their ready mobility makes it possible for them to readily take up and lose heat by movement from place to place.

The factors which control mixing and stirring have a very great influence upon the rate of transfer of heat to and from these materials. That this influence was very important was predicted by Professor Osborne Reynolds as early at 1874*. Reynolds was the first to study the internal turbulence and mixing which appears in liquids and gases when they move at speeds above a certain linear velocity known as their "critical" velocity. Below this critical velocity the motion is essentially straight-line. Reynolds predicted that the increase in turbulence brought about by an increase in velocity would be accompanied by an increase in the rate of heat transfer by convection from and to a stationary surface. This prediction has received quantitative confirmation in many small and large scale experiments.

*Proceedings of the Literary and Philosophical Society of Manchester, 1874. Reprinted by Royds, loc. cit. p. 111 ff.

However, Reynold's explanation for the increased heat transfer with increased velocity is by no means universally accepted. He assumed that the heat interchange at the surface was governed by the molecular bombardment of the surface by molecules from the moving stream.

Others have pointed out that there exists at the surface a film of gas or liquid closely held by attractive forces and that the changes in this film cause the change in the rate of heat transfer. Such a film would transfer heat chiefly by radiation, conduction or natural diffusion. Since these modes give low rates of transfer such a stationary film would interpose an important resistance to heat flow. As the velocity of the moving stream is increased, the thickness of the stationary film is reduced by the "scrubbing" action of the turbulence.

This concept of heat transfer has received much support from certain experiments by Langmuir.*

It is probable that the two concepts are not contradictory. In any event the mathematical expression of the Reynolds law of heat transfer by convection can be be reduced to an expression for that of the film concept by a small change of constants**.

In general, heat transmission by convection can be expressed by the equation:

$$H = A\,(k' + qk''c)\;(T_1 - T_2)$$

Or a gas of temperature T^1 (°F.) and of density q (in pounds per cubic foot) passes over an area A (in square feet) with a velocity c (in feet per second) and transmits H (in B.t.u. per hour) to that area. The coefficients k′ and k″ represent respectively heat transmission by diffusion and turbulence. Unfortunately, they are not constant, but vary not only with the temperature, but also with the composition of the gas. Radiation effects may play some part in this variation.

There is apparently no recorded research upon the rate of heat transfer from a moving stream of hot illuminating gas with its water vapor to the tubes of a condenser coated with tar. Considerable experimental difficulties would attend the attempt to reproduce such plant practice under scientifically controlled conditions.

Two operations occur in the cooling stream of gas, the cooling and condensing of much of the water vapor and tar and simultaneously the cooling of the non-condensing gases and vapors.

Data illustrating the influence of velocity upon the transfer of heat between a dry gas and clean metal surfaces are available from many sources. The experimenters have developed various empirical equations to express the effects noted in their study of the heat transfer. These are often in form somewhat different from the general equation just given, but the experimental results in general support its validity.

Experiments by Nusselt† indicate that coal gas at about 35° C. absorbed heat from a clean brass tube whose temperature was about 102° C. in accordance with the equation:

$$h = b(V_1P_1)\ .786$$

where h is in B.t.u. per square foot per second per °F.; V_1 is the linear velocity of the gas in feet per second; P_1 is the density of the gas in pounds per cubic feet; and b is a constant whose value is 0.00306 for coal gas.

This equation applies only to the gas in turbulent flow, below the critical velocity the transfer of heat is much less than is called for by the above equation.

The above equation also applies only to the type of apparatus used, and cannot be applied directly to gas condenser

*Trans-Am. Electrochem. Soc. 23, 299 (1913).
**See Royds, loc. cit. p. 120 ff.
†Der Warmeuberganga in Rohrleitungen: Zeitschrift des Vereines deutscher Ingenieure, 23rd and 30th October, 1909, Royds, loc. cit. p. 123 ff

practice. It is interesting, however, to note that it would indicate a heat transfer of about one B.t.u. per square foot per hour per °F. from dry gas to clean tube in an installation where the linear velocity is about 6,500 feet per hour. For an installation having twice this linear velocity the coefficient so calculated would be about twice as great.

Such a value for dry gas is of course very much lower than is realized in condenser practice because the crude works gas is saturated with moisture at a high temperature and by far the greater part of the contained heat is given off as latent heat of condensation. This may amount to over 85% of the total heat given up in the condenser.

Fortunately, the rate of heat transfer from condensing steam to water is very great. In the absence of a non-condensing gas the chief limiting function on clean tubes is the velocity on the cold water side of the tube. Heat transfer between steam and water on clean tubes may be 300 or more B.t.u. per square foot per hour per °F. at low velocities. This value may be doubled or tripled by suitably increasing the water velocity. Surface conditions on the water side of course play an important part.

The presence of non-condensing gas very greatly decreases the heat transfer coefficient. This has been shown by many studies of the presence of air in the steam surface condensers of power installations. When the partial steam pressure drops as low as 50% of the total pressure the heat transmission may be as low as 100 B.t.u. per square foot per hour per °F.* This is a partial steam pressure which may exist at the hot end of a gas condenser. As the partial pressure of the steam drops off the rate of heat transfer decreases very much and when this partial pressure reaches values as low as those found in the tubular gas condenser, the chief resistance to heat transfer occurs on the gas rather than the water side of the tubes and for that reason the velocity of the gas is very important, while the velocity of the water does not affect the rate of heat transfer, provided the water velocities are well above the critical velocity for water. In many present day condenser installations, however, the water velocities are so low that an important resistance occurs upon the water side.

It is to be regretted that quantitative information on the transfer of heat by convection does not apply to tubular gas condenser practice. It is clear that the rate of heat transfer at the hot end of the condenser must be many times greater than at the cold end. The rate of heat transfer from a gas containing water and tar (such as crude works gas between the temperatures of 185°F. and 60°F.) to a metal surface under such conditions that portions of these substances condense, is a field which, within the knowledge of this committee, is absolutely untouched by experimental work. The rate must change with changing partial steam pressure as well as with changing velocity. It is therefore believed that no adequate theoretical treatment of the problem is possible until some experimental work upon this field is available.

Clearly, convection is the most important form of heat transfer involved in tubular gas condenser practice. Changes in the design of these condensers leading to higher efficiencies, lower costs, and more satisfactory operation will come through a better understanding of the application of the principles governing this mode.

Convection also plays the most important part in the loss of heat from most of the air-exposed hot main surfaces.

Rates of heat transfer can be increased by increasing turbulence, not only by increasing the linear velocity, but also by passing the stream through bends or over obstructions.

*Cf. for example, R. L. Weighton, "The Efficiency of Surface Condensers", Inst. Naval Arch., 1906. Royds, Transmission of Heat in Boilers, Condensers and Evaporators, p. 174.

THE MEAN TEMPERATURE DIFFERENCE

Attempts to calculate heat transfer coefficients meet an uncertainty which is of considerable importance. This is the so-called mean temperature difference. The gas and water flow counter-currently and establish temperature differences which vary from one end of the condenser to the other. Consequently, it is difficult to fix a mean value which shall represent the difference existing over the entire condensing surface.

Usually, the difference taken is the logarithmic mean calculated from the following formula*:

$$\text{Mean Temp. Dif.} = \frac{\text{Greatest temp. dif.} - \text{Smallest temp. dif.}}{2.3 \log_{10} \frac{\text{(Greatest temp. dif.)}}{\text{Smallest temp. dif.}}}$$

When the quotient of the larger difference divided by the smaller is two or less the simple arithmetic mean or average is used and varies less than 5% from the logarithmic mean.

An illustration will make clear the terms "*greatest* and *smallest* temperature difference": Assume that at one end of the condenser the inlet gas has a temperature of 150°F. and the exit water a temperature of 140°F. and at the other end the exit gas had a temperature of 100°F. and the inlet water a temperature of 80°F. The *greatest* temperature difference is therefore 20°F. and the *smallest* 10°F.

The report of the A. G. A. Committee on Condensing and Scrubbing for 1923 derives a mean temperature which is in error because the incorrect maximum temperature difference is used. When Table 3 of the report for 1923 is properly applied, the mean temperature difference so calculated agrees closely with that calculated from the formula for the logarithmic mean above.

The report of the 1923 committee is also in serious error for the following reason: The logarithmic mean is accurate when equal changes in temperature are accompanied by equal changes in heat transferred. This, however, is not the case in tubular gas condenser practice. At the higher temperature a small decrease in the temperature of the gas stream is accompanied by a large decrease in the heat of the stream. This is due to the condensation of a considerable amount of water and the release of its latent heat. As the temperature of the saturated gas decreases less water is condensed, and the coefficient of heat transfer also drops.

Messrs. Haug and Mason of the U. G. I. Contracting Company have derived another method for calculating mean temperature differences. Mr. Haug in a private communication states:

"The principle of this method is as follows:

"Take a temperature cross section at any point in the condenser which is condensing gas or any other fluid, by means, let us say, of water. The heat given up by the gas must be numerically equal to the heat absorbed by the water (neglecting the amount of heat radiated which is a very small percentage).

"If we therefore take the rise in water temperature and divide it into any number of equal steps, we will get a set of definite water temperatures equally spaced apart. Knowing the number of pounds of water passed per thousand cubic feet of gas (which we do know if we know all the temperatures), each step represents a certain number of B. t.u.'s taken from the gas, so that referring to the curve of heat lost by gas in condensation we can set down a gas temperature opposite each water temperature at the point in the condenser where the water has the temperature assumed.

"Knowing the gas and water temperatures we can find the temperature differential at each of these steps and so obtain the average or mean temperature difference. It will be observed that this takes no account of the particular place in the condenser where these water temperatures occur. This, however, is unnecessary since the extraction of B.t.u.'s

*A discussion of the logarithmic mean, and the mathematical derivation of it for several cases will be found in Royds: Heat Transmission by Radiation, Conduction and Convection, p. 142, and in Hausbrand: Evaporating, Condensing and Cooling Apparatus, Chapter I.

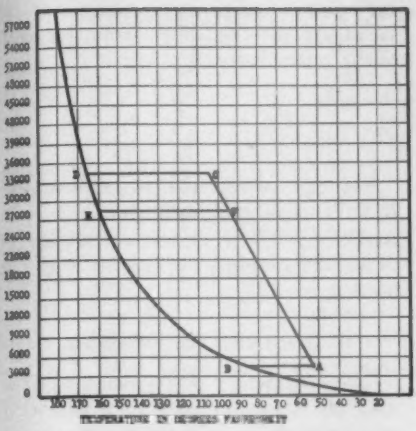


Fig. 1. Curve for Determining Graphically the Mean Temperature Difference Between Water and Condensing Crude Water Gas.

is the work done and consequently is the basis on which the heat transfer is to be calculated, and as the temperature assumed will be a given number of heat units apart, the average will necessarily give a true figure for the average of mean temperature difference.

"I will illustrate this by an example as follows:

Saturated Gas 180° F. contains 60,000 B.t.u.
100° F. 6,500 B.t.u.

Extracted in Condensation 53,500

Water rise 150° — 70° = 80° B.t.u. extracted per lb. water = 80 lbs. water used per M. cu.ft. of gas — $\frac{53{,}500}{80}$ = 670 lbs.

four, which in this case are simply used to explain the method.

"The reason the first and last differences are multiplied by one-half, however, is as you undoubtedly know because they only have half the influence that the other figures have in accordance with the trapezoidal rule for averages."

The same result can be obtained graphically with the aid of a drawing (Figure 1) whose use is explained by Mr. Mason as follows:

"Suppose it is desired to cool gas from the temperature 'D' to the temperature 'B' with cooling water at an initial temperature 'A'.

"The heat to be extracted from the gas is equal to 'D' — 'B' on the vertical scale of the drawing, which is equal to the heat acquired by the cooling water.

"The temperature of the cooling water leaving the condensers will be represented by 'C' which is derived from the number of pounds of cooling water used.

"Draw the straight line 'AC'. If a planimeter is available measure the area 'A', 'C', 'D', 'B'. Divide this area by the height of the figure. This gives the average width of the figure, which multiplied by the scale of the drawing, gives the average temperature difference between gas and cooling water.

"If a planimeter is not at hand take the sum of a series of scaled lines, 'DC' plus 'EF' plus 'etc.' plus 'AB'. The average of the sum of these distances gives the average temperature difference."

Water Temp.	B.t.u.'s Transferred to Water	B.t.u.'s in Gas	Gas Temp.	Temp. Diff.	Averages
70	0	6500	100°	30.0 × ½ =	15
90	13400	19900	145	55.0 × 1 =	55
110	26800	33200	165.5	55.5 × 1 =	55.5
130	40200	46600	174.5	44.5 × 1 =	44.5
150	53500	60000	180	30.0 × ½ =	15
					4/185
				Mean Temp. Diff.	46.25

"Please note that while for clearness I have calculated the pounds of water per thousand and multiplied by the temperature rise to obtain the B.t.u.'s given up to the water, it is not necessary to do this because the B.t.u.'s extracted can be divided into four equal parts since the temperature is practically proportional to the B.t.u.'s added. Of course any number of intervals can be used instead of

For tubular gas condenser practice, your committee therefore recommends the method of Haug and Mason. Certain precautions must, however, be observed when the mean temperatures differences so derived are applied to the determination of overall transfer coefficients. These will be mentioned in the next section.

The Overall Transfer Coefficient

In those complicated cases of heat transfer in which it is impossible to resolve and evaluate the various coefficients involved, an experimentally determined overall coefficient must be used. This is the procedure which must be adopted in the case of the tubular gas condenser. From a knowledge of the area of the heat transfer surface, of the temperature changes which the gas and water undergo, and the amounts of heat involved, it is possible to derive by the aid of the mean temperature differences an overall coefficient which may be used in tubular gas condenser design. However, such an overall coefficient has very limited validity. Thus it applies only to temperature, humidity, and velocity conditions on the gas side which are identical with those in the test from which the overall coefficient was derived. Other conditions, such as the tar or pitch conditions, may possibly limit the validity still further. Until further experimental data are available, it is impossible to predict quantitatively the variation in this overall coefficient for changes in the above conditions. This report has endeavored to show qualitatively the nature of the change in the coefficient with changes in these conditions, and to emphasize the importance of further knowledge in this field.

Where separate coefficients can be resolved, the overall coefficient is calculated by adding the reciprocals of the separate coefficients and taking the reciprocals of the sum. Thus if H were the overall coefficient from a gas to water through metal having clean surfaces, H_g were the coefficient from the gas to the metal, h_m the coefficient of conductivity for the metal, h_w the coefficient from the metal to the water, then

$$H = \frac{1}{\frac{1}{h_g} + \frac{1}{h_m} + \frac{1}{h_w}}$$

The case of the tubular gas condenser is so complicated, however, that it is doubtful whether or not a complete set of valid individual coefficients may ever be determined.

Some Related Problems

The satisfactory performance of a tubular gas condenser presents a number of problems which at first thought appear to lie outside the province of heat exchange, but which should be given consideration because of the important effects which they have upon the rate of heat exchange. The following suggestions are presented as illustrations:

(1) The trapping out of entrained moisture ahead of the condenser in order to prevent this from reaching and adding to the load thrown upon the heating surfaces.

(2) The trapping out of coke and coal dust in order to prevent the thickening of the deposit of tar on the tube walls.

(3) The removal of entrained tar and pitch from ahead of the condenser. These have a higher viscosity than those which condense on the water tubes.

(4) That the gas flow in the condenser be upwards where possible, and especially so in the colder sections. This tends to prevent the tar and water deposited on the hotter portions of the tube from reaching, warming, and building up upon the colder sections. A clean tube surface at the lowest possible temperature is especially desirable at the cold end.

"He would be a rash man who would state that we are finally entering the industrial millenium, but there is a great ray of hope that America is finding herself in the road to a solution of the greatest of all her problems; that is, a method by which social satisfaction is to be attained with the preservation of private industry, of initiative, and full development of the individual."—Herbert Hoover.

Associations Affiliated with A. G. A.

Canadian Gas Association
Date of Affiliation—Mar. 25, 1919.
Pres.—J. J. Humphreys, Montreal Light, Heat & Power Co., Montreal, Que.
Sec.-Tr.—G. W. Allen, 7 Astley Avenue, Toronto.
Conv., 1926.

Empire State Gas and Electric Association
Date of Affiliation—Nov. 21, 1919.
Pres.—M. S. Sloan, Brooklyn Edison Co., Brooklyn, N. Y.
Chairman Gas Section—C. C. Atwood, The Brooklyn Union Gas Co., Brooklyn, N. Y.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.
Annual Meeting, Lake Placid, N. Y., Oct. 1 and 2, 1925.

Illinois Gas Association
Date of Affiliation—Mar. 19, 1919.
Pres.—R. E. Chew, Union Gas & Electric Co., Bloomington, Ill.
Sec.-Tr.—R. V. Prather, 305 Illinois Mine Workers Bldg., Springfield, Ill.
Conv., Chicago, Ill., 1926.

Indiana Gas Association
Date of Affiliation—April 24, 1919.
Pres.—G. M. Johnson, Northern Indiana Gas & Electric Co., South Bend, Ind.
Sec.-Tr.—E. J. Burke, Room 1314, Peoples Gas Bldg., Chicago, Ill.
Conv., 1926.

Iowa District Gas Association
Date of Affiliation—May 21, 1919.
Pres.—C. M. Benedict, Des Moines Gas Co., Des Moines, Iowa.
Sec.-Tr.—H. R. Sterrett, 551 Seventh St., Des Moines, Ia.
Conv., 1926.

Michigan Gas Association
Date of Affiliation—Sept. 18, 1919.
Pres.—B. G. Campbell, Consumers Power Co., Pontiac, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.
Conv., Mackinac Island, Mich., 1926.

Missouri Association of Public Utilities
Pres.—Wiley F. Corl, Community Power & Light Co., St. Louis, Mo.
Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.
Conv., 1926.

New England Association of Gas Engineers
Date of Affiliation—Feb. 19, 1919.
Pres.—H. N. Cheney, Boston Consolidated Gas Co., Boston, Mass.
Sec.-Tr.—J. L. Tudbury, 247 Essex St., Salem, Mass.
Conv., Boston, Mass., Feb. 24 and 25, 1926.

Gas Sales Association of New England
Date of Affiliation—Oct. 1, 1919.
Gov.—J. J. Quinn, Citizens Gas Light Co., Quincy, Mass.
Sec.—J. H. Sumner, 719 Massachusetts Ave., Cambridge, Mass.
Annual Meeting, 1926.

New Jersey Gas Association
Date of Affiliation—April 25, 1919.
Pres.—H. D. Whitcomb, Public Service Electric & Gas Co., Newark, N. J.
Sec.-Tr.—R. A. Koehler, Public Service Electric & Gas Co., Newark, N. J.
Conv., 1926.

Oklahoma Utilities Association
Date of Affiliation—June 16, 1926.
Pres.—R. C. Sharp.
Mgr.—E. F. McKay, Oklahoma City, Okla.
Conv.

Pacific Coast Gas Association
Date of Affiliation—Sept. 18, 1919.
Pres.—F. J. Schafer, Southern California Gas Co., Los Angeles, Calif.
Exec. Sec.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.
Conv., Los Angeles, Calif., 1926.

Pennsylvania Gas Association
Date of Affiliation—April 10, 1919.
Pres.—Wallace G. Murfit, Bucks County Public Service Co., Newtown, Pa.
Sec.-Tr.—Geo. L. Cullen, Harrisburg Gas Co., Harrisburg, Pa.
Mid-Year Meeting, Scranton, Pa., Dec. 7, 1925.

Southern Gas Association
Date of Affiliation—May 20, 1919.
Pres.—S. E. Linton, Nashville Gas & Heating Co., Nashville, Tenn.
Sec.-Tr.—J. P. Connolly, 141 Meeting St., Charleston, S. C.
Conv., New Orleans, La., March 15, 16, 17, 1926.

Southwestern Public Service Association
Date of Affiliation—September 26, 1923.
Pres.—W. E. Wood, Houston Electric Co., Houston, Texas.
Chairman Gas Section—P. E. Nicholls, Galveston Gas Co., Galveston, Texas.
Sec.—E. N. Willis, 403 Slaughter Bldg., Dallas, Texas.
Conv., 1926.

Wisconsin Utilities Association
Date of Affiliation—March 25, 1919.
Pres.—G. H. Wilmarth, Northern States Power Co., Eau Claire, Wis.
Chairman Gas Section—S. B. Sherman, Wisconsin Gas & Electric Co., Racine, Wis.
Exec.-Sec.—J. N. Cadby, 445 Washington Bldg., Madison, Wis.
Conv., 1926.

Geographic Divisions

Eastern States Gas Conference
Date of Formation—April 11, 1923.
Pres.—W. Griffin Gribbel, John J. Griffin & Co., Philadelphia, Pa.
Sec.-Tr.—R. A. Koehler, Public Service Electric & Gas Co., Newark, N. J.
Conv., 1926.

Employment Bureau

SERVICES REQUIRED

GAS COMPANY operating in the Metropolitan District, New York, offers a permanent position to a thoroughly qualified Street Main Foreman. Address giving experience, salary expected and when services are available. Answers will be considered confidential if desired. Address A.G.A.
Key No. 058.

DESIGNER—Well known manufacturer of high grade gas burning appliances has a position open for a competent man for experimental work and design of gas stoves, radiant heaters, tank water heaters, etc. Must be a practical man experienced with gases of various kinds and qualities. State fully your training, experience and salary expected. Address A. G. A.
Key No. 062.

HOME SERVICE—A large operating company in the East, which is increasing the Home Service Departments of its gas and electric companies, desires to secure the services of several young ladies who have had the following Home Service experience in the public utility business: Gas and electric cooking, minor maintenance of gas and electric appliances and public relations work. The positions in question will require some traveling and offer a wonderful opportunity for advancement. State age, experience and salary desired in first letter. Address A. G. A.
Key No. 067.

WANTED—A large Eastern Company, operating a number of gas and electric properties, desires to employ a young man or young lady to assist in the General Office of the New Business Department. One who has had sales, newspaper, advertising and public relations experience in the public utility business, as well as knowing how to compile and maintain all records and data pertaining to the Department. Good salary and wonderful opportunity for advancement in a progressive organization. State age, salary expected and past experience. Address A. G. A.
Key No. 068.

ENGINEER—A large Eastern engineering and contracting organization, specializing in public utility work, desires the services of an energetic engineer of good personality with technical education and experience in construction operation and design of coal and water gas plants, to handle engineering and preparation of plans and specifications for new gas works and works improvements, also to handle such questions with customers on contracts entered into. Address A. G. A.
Key No. 069.

SERVICES OFFERED

INDUSTRIAL ENGINEER available on short notice. Nine years' experience in industrial and commercial department supervision. Record and references will be furnished. Address A. G. A.
Key No. 192.

WANTED: Position by a Gas Engineer with twenty-three years' experience in all branches of the gas business and who has had experience in plant efficiencies and gas distribution problems. His connection with a strong operating company would make him a valuable man for a holding or a large operating company owing to his ability to reduce manufacturing and distribution costs. Would prefer position in the East. Address A. G. A.
Key No. 193.

PUBLIC UTILITY EXECUTIVE, with broad experience in engineering, management and finance desires position. Offers character, integrity and ability with service. Address A. G. A.
Key No. 196.

WANTED—Position as Manager or Engineer for a gas or gas and electric property by practical Gas Engineer thoroughly conversant with management problems, rates, industrial business development, design, construction and operation of coal and water gas plants, high and low pressure transmission and distribution. Considerable experience with electric power plants and natural gas properties. Technical education and twenty-two years' experience, fourteen years of which have been in gas and public utility work. Address A. G. A.
Key No. 197.

OPERATING ENGINEER desires communication with a utility property requiring the services of an operating engineer. Property either electric or gas or combined preferably in a medium size city with 25,000 customers or upward. Location preferably north central State or Canada. Position general superintendent or manager. Have had twenty-one years active contact with operating problems of diversified nature in electric, gas, water and telephone utility service as cadet engineer, superintendent of distribution, chief engineer, general superintendent and manager. Am at present employed. Address A. G. A.
Key No. 198.

WANTED: Position as manager or superintendent of a coal, water or combination gas plant, by a technical man, thirty-five years of age, with thirteen years' all around gas experience. Services available upon reasonable notice to present employer. Address A. G. A.
Key No. 199.

MAN, 43 years of age. Over 20 years' experience in the gas business handling fitting, main, service and meter departments of large eastern gas company, sales, production and cost accounting in an allied industry. Studied mechanical engineering and gas engineering course of the American Gas Institute. Can furnish excellent references and fidelity bond. Available upon short notice. Address A. G. A.
Key No. 200.

POSITION—Sales Manager of new business on Domestic, Hotel and Industrial appliances, desires similar position with promising future. Fourteen years' experience from shop through all commercial departments of one of the largest Utility Companies on the East. Thirty-six years old. Single. Services available in two weeks. Address A. G. A.
Key No. 201.

TECHNICAL MAN—(34) desires position as manager or superintendent of gas plant in city of 20,000 to 50,000 population; have had twelve years' experience in gas business of which last six have been as manager of gas properties; experience as superintendent of high and low pressure distribution; business and technical education; married; available immediately; references from present and former employers; prefer South. Address A. G. A.
Key No. 202.

POSITION WANTED—High grade specialty salesman, specializing in sales of gas-fired boilers and automatic water heaters for past 15 years; will be open for sales position with manufacturer or gas company October 1, 1925; thoroughly conversant with all phases of water heating and house heating; best of references from past and present employers together with details of ability will be submitted; road experience, no objection to travel. Address A. G. A.
Key No. 203.

WANTED—Position as manager of relatively small gas company or as engineer of larger property. Coal or water gas. Young, technically trained engineer (chemical and mechanical) with 10 years' unusually broad experience in all phases of industry, including manufacture, commercial and industrial, wishes to locate with property in need of man who can show the kind of results that mean increased net earnings. Address A. G. A.
Key No. 204.

WANTED—Am open for position as appliance salesman with appliance manufacturer, experience covers over fifteen years in the sale of gas ranges, automatic water heater and heating appliances, or as manager of appliance sales department with a gas operating company, experience includes executive and technical training. Married. A1 references. Address A. G. A.
Key No. 205.

Advisory Council

GEO. S. BARROWS ..... Providence, R. I.
J. M. BENNETT ..... Philadelphia, Pa.
S. T. BODINE ..... Philadelphia, Pa.
C. N. CHUBB ..... Davenport, Iowa
H. H. CLARK ..... Chicago, Ill.
CHAS. M. COHN ..... Baltimore, Md.
R. C. CONGDON ..... Hempstead, N. Y.
WM. M. CRANE ..... New York, N. Y.
J. E. DAVIES ..... Chicago, Ill.
S. E. DEFRESE ..... Rome, Ga.
J. S. DEHART, JR. ..... Newark, N. J.
CHAS. H. DICKEY ..... New York, N. Y.
L. R. DUTTON ..... Jenkintown, Pa.
P. H. GADSDEN ..... Philadelphia, Pa.
WM. GOULD ..... Boston, Mass.
W. GRIFFIN GRIBBEL ..... Philadelphia, Pa.
EWALD HAASE ..... Milwaukee, Wis.
R. B. HARPER ..... Chicago, Ill.
J. W. HEINS ..... Philadelphia, Pa.
ARTHUR HEWITT ..... Toronto, Can.
A. A. HIGGINS ..... Providence, R. I.
F. H. KNAPP ..... Pittsburgh, Pa.
A. P. LATHROP ..... New York, N. Y.
A. B. MACBETH ..... Los Angeles, Calif.
T. N. MCCARTER ..... Newark, N. J.
C. O. G. MILLER ..... San Francisco, Calif.
H. A. NORTON ..... Boston, Mass.
G. W. PARKER ..... St. Louis, Mo.
W. H. PEITES ..... Newark, N. J.
A. P. POST ..... Philadelphia, Pa.
ORD PRESTON ..... Washington, D. C.
M. C. ROBBINS ..... New York, N. Y.
GEO. D. ROPER ..... Rockford, Ill.
W. A. SAUER ..... Chicago, Ill.
H. S. SCHUTT ..... Philadelphia, Pa.
R. M. SEARLE ..... Rochester, N. Y.
F. C. WEBER ..... New York, N. Y.
L. J. WILLIEN ..... Boston, Mass.

AMERICAN GAS ASSOCIATION, INC.

HEADQUARTERS: 342 MADISON AVE., NEW YORK, N. Y.

Officers and Directors

PRESIDENT	H. C. ABELL	New York, N. Y.
VICE-PRESIDENT	A. B. MACBETH	Los Angeles, Cal.
SECRETARY-MANAGER	ALEXANDER FORWARD	New York, N. Y.
TREASURER	H. M. BRUNDAGE	New York, N. Y.
ASS'T TREASURER	W. CULLEN MORRIS	New York, N. Y.
SECTIONAL VICE-PRES.	R. C. CORNISH	Philadelphia, Pa.
SECTIONAL VICE-PRES.	J. P. HANLAN	Newark, N. J.
SECTIONAL VICE-PRES.	WENDELL L. SMITH	Battle Creek, Mich.
SECTIONAL VICE-PRES.	H. C. DAVIDSON	New York, N. Y.
SECTIONAL VICE-PRES.	F. L. BLANCHARD	New York, N. Y.
SECTIONAL VICE-PRES.	H. O. LOEBELL	New York, N. Y.

D. D. BARNUM	Boston, Mass.
R. B. BROWN	Milwaukee, Wis.
HOWARD BRUCE	Baltimore, Md.
GEO. B. CORTELYOU	New York, N. Y.
M. B. DALY	Cleveland, O.
H. L. DOHERTY	New York, N. Y.
R. J. HOLE	Greensboro, N. C.
J. J. HUMPHREYS	Montreal, Can.
ALFRED HURLBURT	Pittsburgh, Pa.
J. B. KLUMPP	Philadelphia, Pa.
F. A. LEMKE	Kalamazoo, Mich.
DONALD McDONALD	New York, N. Y.
B. J. MULLANEY	Chicago, Ill.
CHARLES A. MUNROE	Chicago, Ill.
C. E. PAIGE	Brooklyn, N. Y.
C. J. RAMSBURG	Pittsburgh, Pa.
D. J. YOUNG	Tacoma, Wash.

Section Officers

ACCOUNTING—Chairman	H. C. DAVIDSON	New York, N. Y.
Vice-Chairman	DeWITT CLINTON	Worcester, Mass.
Secretary	H. W. HARTMAN	Ass'n Headqtrs.
PUBLICITY AND ADVERTISING		
Chairman	F. L. BLANCHARD	New York, N. Y.
Vice-Chairman	A. W. HAWKS, Jr.	Baltimore, Md.
Secretary	C. W. PERSON	Ass'n Headqtrs.
COMMERCIAL—Chairman	J. P. HANLAN	Newark, N. J.
Vice-Chairman	J. B. MYERS	Philadelphia, Pa.
Secretary	R. L. BURDICK	Ass'n Headqtrs.
INDUSTRIAL GAS—Chairman	H. O. LOEBELL	New York, N. Y.
Vice-Chairman	F. F. CAULEY	Chicago, Ill.
Secretary	C. W. BERGHORN	Ass'n Headqtrs.
MANUFACTURERS—Chairman	WENDELL L. SMITH	Battle Creek, Mich.
Vice-Chairman	WATSON DERWENT	Rockford, Ill.
Secretary	C. W. BERGHORN	Ass'n Headqtrs.
TECHNICAL—Chairman	R. C. CORNISH	Philadelphia, Pa.
Vice-Chairman	J. P. HAFTENKAMP	Rochester, N. Y.
Secretary	H. W. HARTMAN	Ass'n Headqtrs.

SECRETARY-MANAGER	ALEXANDER FORWARD	Ass'n Headqtrs.
ASS'T SECRETARY-MANAGER	H. W. HARTMAN	New York, N. Y.